Mar. 1997
No. 60110

JVC Service Manual

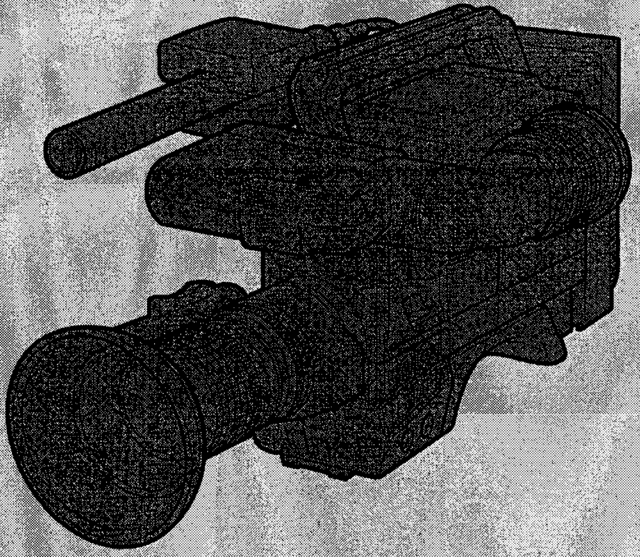
THREE CCD COLOR VIDEO CAMERA
DREI CCD-FARBVIDEO KAMERA
CAMERA VIDEO COULEUR A TROIS CCD

MODEL KY-D29U
MODELL MODÈLE KY-D29E

VICTOR COMPANY OF JAPAN, LIMITED

No. 60110

JVC Service Manual



(Lens, viewfinder, microphone and camera adapter are optional.)

MODEL KY-D29U/KY-D29E

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Printed in Japan

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JVC

INTRODUCTION

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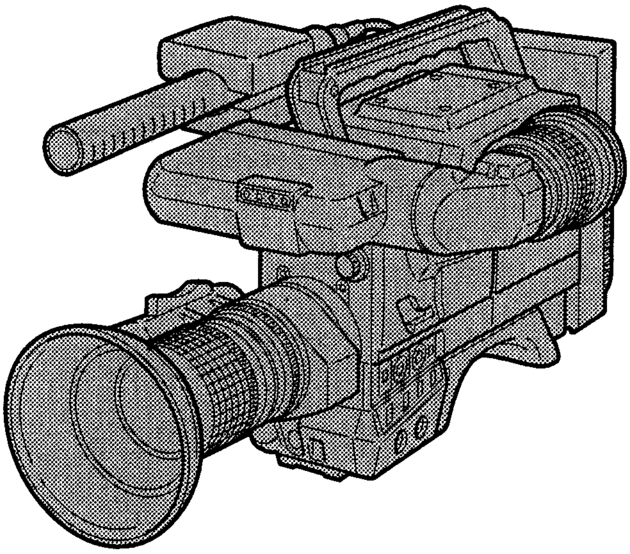
OTHERS

COLOR VIDEO CAMERA

KY-D29

INSTRUCTIONS



Illust shows the KY-D29 video camera with an optional camera adapter (KA-27), viewfinder, and lens.

For Customer Use:
Enter below the Serial No. which is located on the body.
Retain this information for future reference.

Model No. KY-D29

Serial No.

SC96757

⚡ **CAUTION** ⚠

RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION : TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

⚡ The lightning flash with arrowhead symbol, within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

⚠ The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Due to design modifications, data given in this instruction book are subject to possible change without prior notice.

WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

AVERTISSEMENT:
POUR EVITER LES RISQUES D'INCENDIE OU D'ELECTROCUTION, NE PAS EXPOSER L'APPAREIL A L'HUMIDITE OUT A LA PLUIE.

POWER SYSTEM

This color video camera should be used with 12 V DC only.

CAUTION:

To prevent electric shocks and fire hazards, do NOT use other than specified power source.

Système d'alimentation

Cette caméra vidéo couleur ne doit étre utilisée que sur tension continue de 12 V.

Attention:

Pour éviter tout risque d'incendie ou d'électrocution, n'utilisez aucune autre source d'alimentation.

Information for USA

This device complies with Part 15 of the FCC Rules.
Changes or modifications not approved by JVC could void the user's authority to operate the equipment.

INFORMATION (FOR CANNADA)
RENSEIGNEMENT (POUR CANADA)

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numénque de la class B respecte toutes les exigences du Réglement sur le matériel brouilleur du Canada.

Changes or modifications not approved by JVC could void the user's authority to operate the equipment.

Thank you for purchasing the JVC KY-D29.

We do not assume liabilities for a loss of the recording contents in the case of a recording failure due to a function in the color video camera, video tape recorder or video cassette tape in use.

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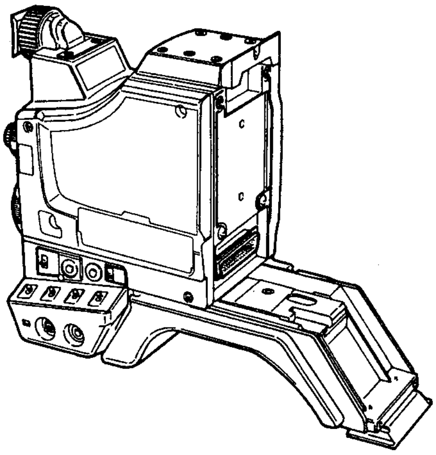
GENERAL FEATURES

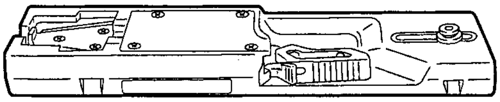
- Newly-developed, 380,000(NTSC), 430,000(PAL) pixel CCDs Achieve a high sensitivity of F/11 at 2000 lux, a high resolution of 850 lines and greatly improved smear characteristic.
- The digital processing camera incorporating the newly-developed DSP assures a dynamic range of 600%. The camera head also incorporates a DNR circuit which provides a nominal S/N of 62 dB as well as a high 65 dB S/N in operation.
- A Super LOLUX circuit for a minimum practical illumination of 0.35 lux.
- A vertical resolution improvement circuit.
- ALC (Automatic Level Control), FAS (Full Auto Shooting), FAW (Full-time Auto White balance adjustment) and EEI (Electronic iris) circuits.
- Black stretch and black compression circuits.
- An ACCU-FOCUS circuit for accurate focusing.
- A smooth transition circuit eliminating suddly change during sensitivity and white balance switching.
- A time/date generator.
- A newly-developed viewfinder (optional) featuring improved performance including the easy-to-see screen and large eyecup.
- Other features
    - A SMPTE (NTSC), EBU (PAL) type color bars generator.
    - The Same interface as previous models allowing the connection of the existing BR-S422, etc.
    - Common peripheral components as the KY-27 series cameras.
    - Optical filter with built-in cross effect.
    - Audio control potentiometer.
    - Easy-to-use set-up menus.

1. INTRODUCTION

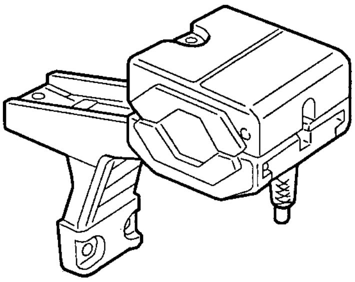
STANDARD CONFIGURATION



Color video camera



Tripod base



Microphone holder

COMPOSITION OF THIS MANUAL

This manual is composed of the sections described in the following.

SECTION 1 INTRODUCTION

This section describes a list of accessories provided with this product, its main features and the precautions to be taken for the correct use of the product. Please be sure to read this section first.

SECTION 2 CONTROLS, CONNECTORS AND INDICATORS

This section describes the names of the parts and their functions of the camera head and the minimum required components for shooting which includes the camera adapter (KA-27), lens and viewfinder (VF-P116).

It also contains a description of the warning indicators inside the viewfinder and its screen display.

SECTION 3 BASIC SYSTEM CONNECTIONS AND ADJUSTMENTS

This section describes how to install the basic system, how to prepare the power supply and how to perform any adjustments which are required before shooting.

You will be ready for shooting after reading this section.

SECTION 4 SHOOTING (BASIC OPERATIONS)

This section focuses on the basic shooting operations and the white balance adjustment which is a "must" to be learned before shooting, so that even a beginner can start shooting immediately after reading this section.

SECTION 5 SHOOTING (APPLIED OPERATIONS)

This section describes the switch setup according to individual shooting conditions.

It also covers the method for obtaining a variety of special effects by selecting items from the menus displayed on the viewfinder screen.

SECTION 6 SYSTEM UPGRADING

This section describes the methods for connecting the camera to other systems such as a switcher or remote control unit. The methods for connection of the accessories required for system upgrading and other peripheral components are also described in this section.

SECTION 7 OTHERS

This section includes the measures to be taken in case of trouble with the operation of the camera.

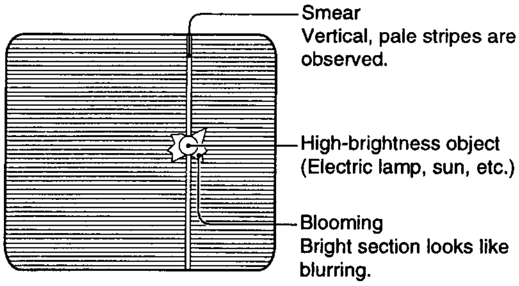
It also includes the specifications of the camera.

PRECAUTIONS HANDLING PRECAUTIONS

- **Supply Voltage**
  Make sure that the power is between 10.5V and 15.0V DC. If the power voltage is too low, abnormal color and increased noise may occur.
  Do not exceed 15.0V DC in any case, or the unit could be damaged.

- **Precautions before carrying the camera**
  Be careful not to subject the camera to a strong impact or to drop it. Be sure to hold the camera by the carrying handle. Do not hold the lens or the viewfinder section as this may cause damage to these parts.

- **Specific phenomena to CCD**
  Smear and blooming
  When a CCD picks up the image of a light source with a high brightness, white stripes may be observed vertically above or below the light source (smear) or the light may seem to blur around the light source in the case when this is extremely bright (blooming).
  This camera uses CCDs which provide extremely reduced smear and blooming features, but care against these phenomena is still required when shooting a very bright light source.


Smear
Vertical, pale stripes are observed.
High-brightness object
(Electric lamp, sun, etc.)
Blooming
Bright section looks like blurring.

Monitor screen

- **Fold-back distortion**
  A stripe pattern or line may look as if it is zigzagging.
  White spot
  White spots may be observed on the screen when the CCDs are used under high temperatures.

- **To conserve power, switch the power off when the camera is not in use.**

- **Ambient temperatures**
  Please observe the operating temperature range (–5°C to +45°C) specified in "Specifications" on page 53. Be careful not to operate the camera at above the operating temperature range, for this may result in malfunction and affect the CCDs seriously, causing a phenomenon in which white spots are observed on the screen.

- Influence of strong radio and magnetic waves when the camera is used near a radio or television transmission antenna or in a place subject to strong magnetism from a transformer, motor, etc., the camera may be interfered with and noise occur or the colors may be altered.

- **Use of a wireless microphone near the camera**
  Be careful when using a wireless microphone and receiver near the camera during shooting, for this may cause the noise from the camera to interfere with the wireless microphone receiver.

- **430 MHz band interference noise may occur when using a condenser microphone.**

- **Caution on interference to the reception of radio and television receivers.**
  When the camera is used in a general household situation, it may cause interference in the reception of the radio and television receivers in the home . Be sure to use the camera at a suitable distance from these kinds of equipment.

- **Battery backup**
  The date, time and accumulated recording time data is backed up by the lithium battery in the camera head. When the data is no longer able to be backed up, it may mean that the lithium battery has to be replaced : please consult your local JVC-authorized service dealer.

- **Accumulated recording time display**
  The accumulative recording time of this unit should be used strictly as a guide.

- **Setup level**
  The video signal of this camera is factory-set with a setup level. If you want to delete the setup, please consult your local JVC-authorized service dealer.

- **Connection of other equipment**
  Be sure to turn the power switches of this unit and the connected equipment to OFF before connecting them.
  If they are interconnected while the power switches are in the ON positions, it would not be possible to turn power ON normally later.

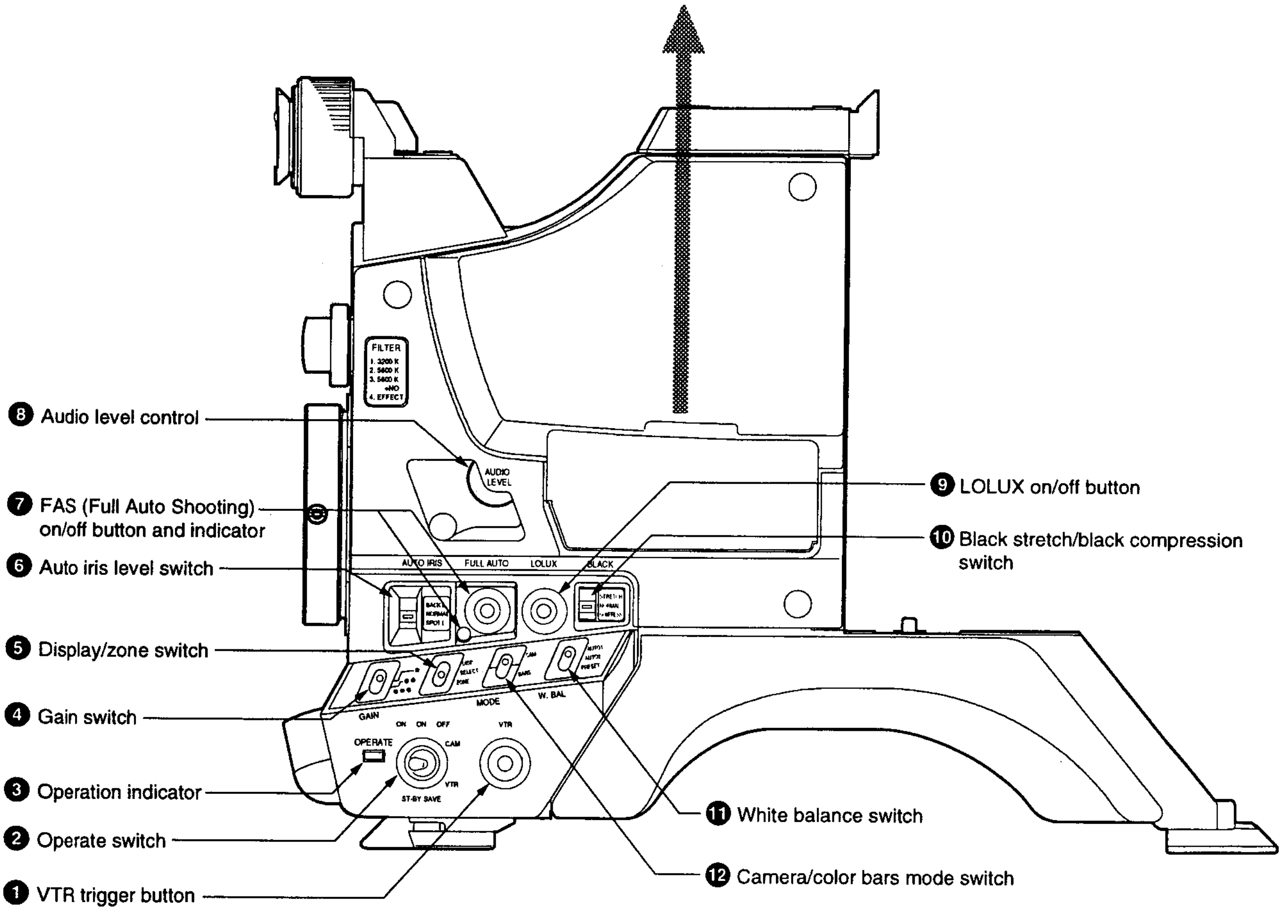
- **Connection of remote control unit**
  When connected with the remote control unit, the iris of the lens is forcefully controlled from the remote control unit, disabling the manual control of the iris.
  If you want to control the lens iris manually or to use a lens remote control unit, the internal switch position has to be changed. Consult with your local JVC authorized service dealer when this occurs.

- **The camera may be unstable in the period immediately after the power is turned on, but this is not a malfunction.**

2. CONTROLS, CONNECTORS AND INDICATORS

2-1 CAMERA HEAD (KY-D29)

[Right side panel]



Reference Page 8. (Setup/Mode Setting Selection)

❽ Audio level control
❼ FAS (Full Auto Shooting) on/off button and indicator
❻ Auto iris level switch
❺ Display/zone switch
❹ Gain switch
❸ Operation indicator
❷ Operate switch
❶ VTR trigger button
❾ LOLUX on/off button
❿ Black stretch/black compression switch
⓫ White balance switch
⓬ Camera/color bars mode switch
FILTER
AUDIO LEVEL
AUTO IRIS
FULL AUTO
LOLUX
BLACK
GAIN
MODE
W. BAL
OPERATE
CAM
VTR
ST-BY SAVE

❶ **[VTR] VTR trigger button(Recording Start/Stop)**

This momentary button initiate or end recording if the VCR is in the record pause mode.
The lens is interlocked with the VTR trigger button on the front panel.

❷ **[OPERATE] Operate switch**

The camera can be turned ON/OFF and the VCR can be switched to ON/ST-BY, ON/SAVE, OFF/SAVE by this switch.
Reference Page 28.

CAUTION :

Quick operation of ON and OFF for the OPERATE switch or POWER switch may cause malfunctions such as the power cannot be started, etc.
In such a case, turn the POWER switch OFF and leave it for several seconds (5 sec. or more) then turn the power ON.

❸ **Operate indicator**

Bright : In ON/ST-BY and ON/SAVE position.
Dim : In OFF/SAVE position.
Off : KA-27 power switch is OFF or power to unit is exhausted or not connected.

❹ **[GAIN] Gain switch**

When the illumination of the object is insufficient, set this switch to boost the gain electrically.
Reference Page 36, 42.

2-1 CAMERA HEAD (KY-D29) (Cont'd)

⑤ [DISP SELECT/ZONE] Display / zone switch

This switch selects the function for displaying the camera switch and other setups on the viewfinder screen.

- Whether or not the display should be output to the monitor can be selected with the [DISP MIX] switch㊱.

- **[DISP SELECT] Status display select**

Three information display modes are cycled between by pushing this switch repeatedly in the up DISP.SELECT position.

Status 0 : The camera setting conditions such as ACCU. FOCUS and LOLUX are displayed.
Status 1 : Besides Status 0, accumulated or remaining record time, battery and input DC voltage, VTR status, iris level and audio levels are displayed.
Status 2 : The present camera conditions including scene file name white balance mode, filter position, shutter speed, gain, iris level, iris detect mode, full auto shoot on/off, digital noise reduction mode, accum or remain record time are displayed.

Reference page 16.

- **[ZONE] Safety zone select**

Three overscan safety zone modes are cycled between by pushing this switch repeatedly down in the ZONE position.

Mode 0 : Video only.
Mode 1 : Safety outline.
Mode 2 : Center markings and safety outline.

⑥ [AUTO IRIS] Auto iris level switch

This switch selects the automatic iris adjustment reference value according to the condition in which the camera is used.

BACK. L : Under back light (Open the iris about 1 step from the standard level.)
NORMAL : Normal condition
SPOT. L : Under spotlight (Close the iris about 1 step from the standard level.)

Reference Page 37.

⑦ [FULL AUTO] Full auto shooting ON/OFF button and indicator

- This momentary switch turns this function on and off, with a green indicator light.
- Full auto shooting combines the auto iris, auto level control and full auto white (FAW) to automatically adjust the video signal level and the white balance to their optimum levels.
- The iris is placed in automatic even if the iris mode switch of the lens is in manual.
- The gain will vary continuously to the maximum of +18dB.

The shutter speed will vary continuously to the minimum of 1/250 of a second.
Reference [Full Auto Shooting (FAS) function] on page 37.

⑧ [AUDIO LEVEL] Audio level control

Rotate this knob to vary the level of the audio signal input into the microphone input connector.
Adjust to the optimum audio level for the recording by watching the audio level display on the viewfinder.
Reference "Viewfinder display" on page 15.

⑨ [LOLUX] LOLUX on/off button

This button toggles the LOLUX mode on and off.

- LOLUX gain gives extremely low light level sensitivity for special applications. This will result in an increase of 33 dB in the LOLUX and 39 dB in the SUPER LOLUX modes.
- LOLUX operation takes priority over normal gain operation. If the unit is placed in the LOLUX mode when it is in full auto shooting mode, the auto level control (ALC) (one of the full auto shooting functions) will be made inactive, so that the LOLUX mode is given preference (FAW still remains active).

Reference [LOLUX GAIN UP] on page 36.
Reference [ADVANCED MENU] on page 42.

⑩ [BLACK] Black stretch/black compression switch

This switch control the black gain.

BLACK STRETCH : Boosts the black gain.
NORMAL : Normal black gain.
BLACK COMPRESS : Reduces the black gain.

Reference Page 37.

⑪ [W.BAL] White balance switch

There are three white balance modes possible with this switch.

AUTO 1 : If white balance is performed with the switch in this position it will be memorized into AUTO 1.
AUTO 2 : If white balance is performed with the switch in this position it will be memorized into AUTO 2.
PRESET : A non-erasable white balance setting to 3200K. An emergency setting for outdoors in with a 5600K or 5600K+ND filter turret setting.

- FAW (Full-time Auto White) mode can be set to AUTO 1. AUTO 2 or PRESET with the ADVANCED MENU (see page 42).

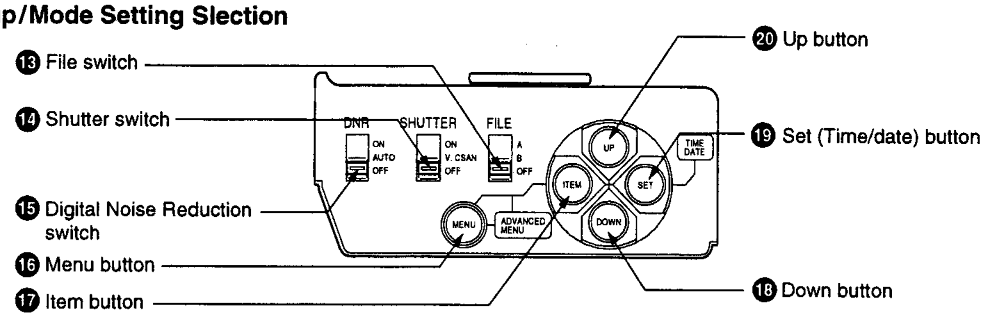
In the FAW mode, video color temperatures are constantly sampled for automatic adjustment to a proper white balance.

⑫ [MODE] Camera/color bars mode switch

This switche operate between camera and color bars video output.

2-1 CAMERA HEAD (KY-D29) (Cont'd)

Setup/Mode Setting Slection



⑬ **[FILE] File switch**

This switch registers the set values at the ADVANCED MENU screen and reads the registered FILE.

FILE A : Register to the FILE A. (in registration)
Shooting can be carried out with the set values registered to the FILE A. (in reading)

FILE B : Register to the FILE B. (in registration)
Shooting can be carried out with the set values registered to the FILE B. (in reading)

OFF : Registration cannot be carried out. (in registration)
Shooting can only be carried out with the set values registered, other when the power is on or at the factory.

The items provided are items for the ADVANCED MENU.
Reference page 41.

⑭ **[SHUTTER] Shutter switch**

ON : This mode allows setting of different shutter speeds.
To change shutter speed push the UP⑳ or DOWN⑱ buttons.

V.SCAN : This mode helps adjust the shutter speed to match the scan rate of computer monitor.
Place the switch down in the V.SCAN position and then use the UP or DOWN buttons to adjust the speed.

OFF : This mode corresponds to the standard 1/60 (NTSC), 1/50 (PAL).
Reference [Display shutter speed] on page 17.

■ WHENTO USE

A shutter speed of 1/60th (NTSC), 1/50th (PAL) second is too slow to prevent blurring from normal actions when as subject is moving.
This gives a smooth and natural effect when watching motion normally, but in certain applications the video is to be displayed in slow motion or as a freeze. The blurring in this case reduces the possible sharpness of the image.

As one increases the shutter speed the amount of light collected is less and less, so consideration should be given to the effects of openning the iris and increasing gain.

Opening the iris reduces depth of field and causes foreground and background objects to go out of focus. This is a useful artistic technique.

⑮ **[DNR] Digital Noise Reduction switch**

The DNR allows improvement of the S/N. However, as this increases residual images in the case of moving subjects, the DNR should be turned on/off while observing the output video.

ON : The DNR is activated.
The setting values can be changed as described in "DNR LEVEL" on page 44.

AUTO : The DNR varies automatically according to the current gain.

OFF : The DNR is deactivated.

CAUTION :
If the sensitivity is increased (e.g., to 9dB or 18dB) under fluorescent lighting and the DNR is used at ON, these may be electrical noise caused by the flickering.

⑯ **[MENU] Menu button**

⑰ **[ITEM] Item button**

⑱ **[DOWN] Down button**

⑲ **[SET (TIME DATE)] Set (Time/date) button**

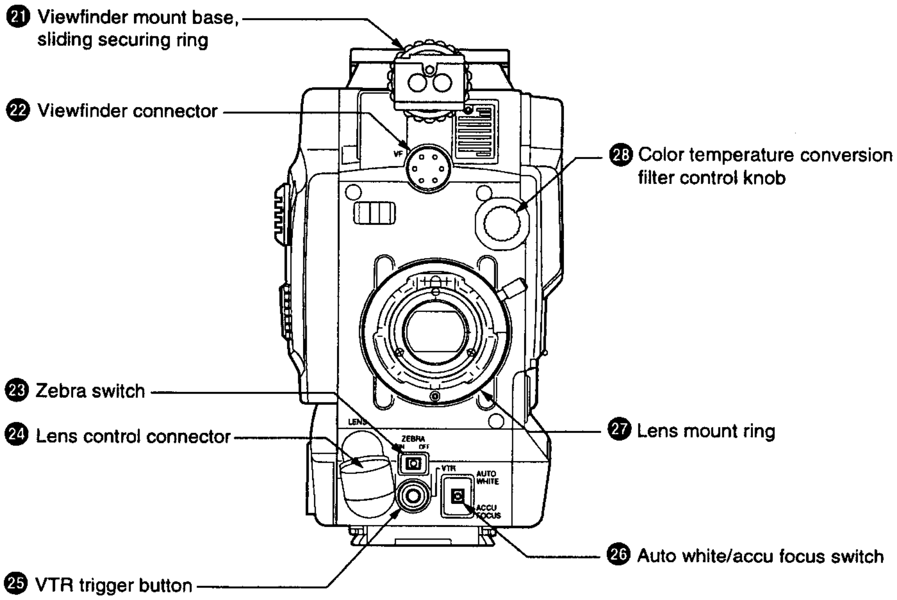
Pressing this button at the standard screen will display TIME DATE (Time/date) in the viewfinder and MONITOR OUTPUT connector.
Reference "TIME DATE Display" on Page 17.

⑳ **[UP] Up button**

Buttons ⑯ to ⑳ are used to control the menu screens.
Reference "Menu Screen" on page 39.

2-1 CAMERA HEAD (KY-D29) (Cont'd)

[Front panel]



㉑ **Viewfinder mount base, sliding securing ring**
Mount the VF-P116 or VF P115 viewfinder (optinal) on the base and secure it using the sliding securing ring.
Reference "Viewfinder installation" on page 19.

㉒ **[VF] Viewfinder connector**
Connect to the cable from viewfinder.

㉓ **[ZEBRA] Zebra switch**
When this switch is ON, a zebra pattern is displayed with a brightness corresponding to 70% to 80% (or more than 100%) video levels on the viewfinder screen. This pattern can be used as a reference for manual adjustment of the lens iris.

- The display is visible only on the viewfinder screen. The zebra pattern is not displayed in the video output signal.
Reference: "Zebra pattern display during manual adjustment" on page 35.

㉔ **[LENS] Lens control connector**
Connect 12pin lens control cable from lens.
Lens connector function

Pin No.	function	Pin No.	function
1	RET switch	7	IRIS position
2	VCR trigger	8	IRIS A/R INPUT
3	GND	9	EXTENDER position
4	Lens AUTO/MANU control	10	ZOOM position
5	IRIS control	11	—
6	+12V DC	12	—

Lens connector function

㉕ **[VTR] VTR trigger button (record start/stop button)**
With the VCR set in record pause mode, record start/stop can be effected with this button.
(It is interlocked with the lens and the VTR trigger button on the side panel.)

㉖ **[AUTO WHITE / ACCU FOCUS] Auto white / accu focus**

- AUTO WHITE:
First position a white object to occupy 80% of the center of the image.
Setting this switch to the upper position ("AUTO WHITE") will provide automatic adjustment for white balance.
Is not activated in preset, full auto shooting, full-time auto white blance and color bar mode.
Reference : "White balance adjustment" on page 34.
- ACCU-FOCUS
  - When this switch is set to "ACCU FOCUS" in the lower position, The lens iris will be forced to open.
  - The object depth can be reduced and the lens focusing can be adjusted more accurately.

CAUTION :

- As the automatic shutter is activated here, flicker may appear on the screen depending on the lighting conditions (such as a fluorescent lamp, etc.)
- Operation is not possible in the LoLux and Super-LoLux modes.

㉗ **Lens mounting ring / Lens lock lever**
Hold the lens and use the knob to twist the ring counterclockwise to release lens.
To mount lens make sure the lens guide pin fits well, and then twist the ring clockwise until firm.
Reference "Lens installation" on page 19

㉘ **[FILTER] Color temperature conversion filter control knob**
This knob changes the internal filter of color temperature.
Reference "Filter" on page 31.

2. CONTROLS, CONNECTORS AND INDICATORS

2-1 CAMERA HEAD (KY-D29) (Cont'd)

㉙ **[REMOTE] Local Remote control connector (6pin)**
This remote connector allows the connection of the RM-LP80/LP35/LP37 local remote control unit (optional) and the VC-P891/VC-P892 interface cable (optional)
Reference "Connection with a local remote control unit" on page 49.

㉚ **[MONITOR OUTPUT] monitor output connector**
Video output is for camera composite video only. Return video signals from the VCR are not output. The function display on the viewfinder can be selected with [DISP MIX]㊱.

㉛ **[GENLOCK INPUT] Sync signal input connector**
External reference composite video or black burst video input.This camera cannot be genlocked with the VCR playback signal.
Reference "Connection to the switcher" on page 45.

㉜ **[PHASE H] Horizontal phase control**
Use this control to adjust the H sync phase while the genlock signal is input.

㉝ **[PHASE SC FINE] Color sub-carrier phase control**
Use this control to fine-adjust the SC phase while the genlock signal is input.

㉞ **[PHASE SC COARSE] Color sub-carrier phase coarse adjustment control**
Use this control to coarse-adjust the SC phase while the genlock signal is input.
The SC phase will toggle between 0°, 90°, 120°, and 180°.
Reference "Connection to the switcher" on page 45 for㉜ through㉞.

㉟ **[MIC INPUT +48V] Microphone input switch**
This switch selects whether a +48 V voltage is to be supplied at the microphone input connector㊳ or not.
ON : +48 V is supplied.
OFF : +48 V is not supplied.

㊱ **[DISP MIX] Character display switch**
This switch selects whether the characters on the viewfinder screen are to be displayed in the video output from the MONITOR OUTPUT㉚ or not.
ON : Characters are displayed.
OFF : Characters are not displayed. (Time is displayed)

㊲ **Microphone holder mounting screws**
The provided microphone holder can be mounted here.
Reference [Microphone installation] on page 19.

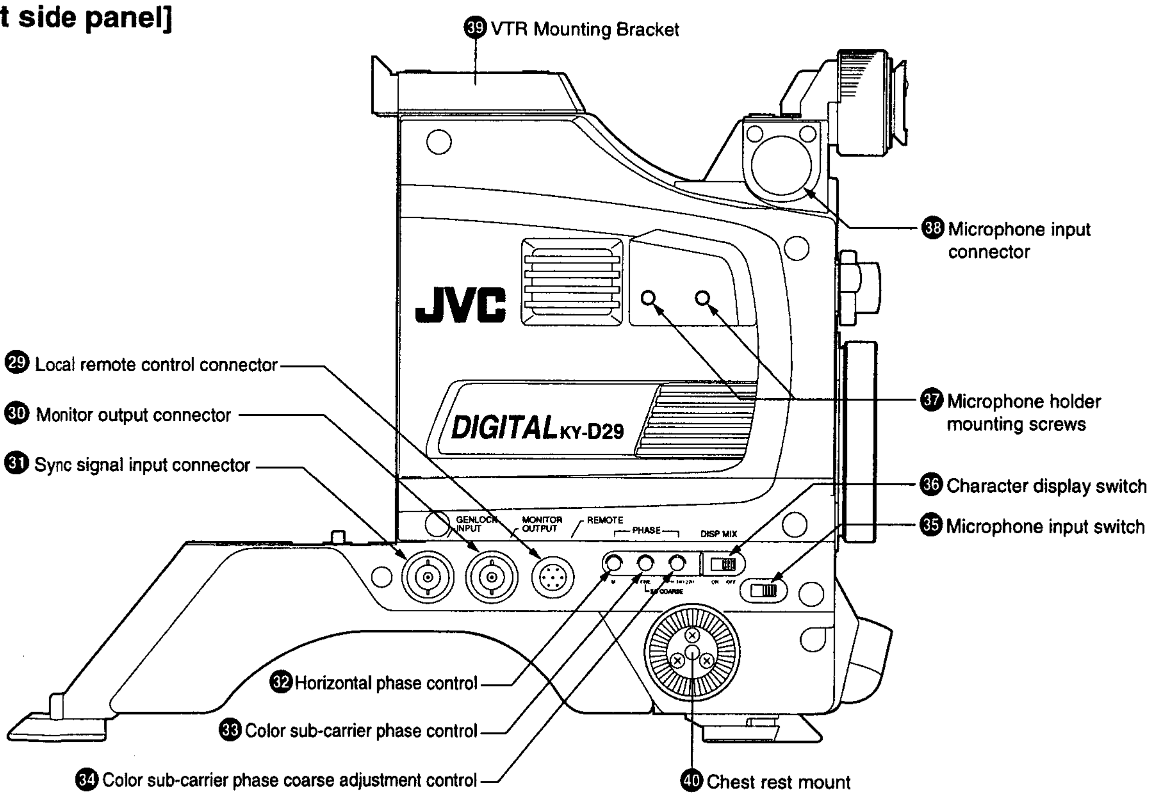
㊳ **[MIC] MICROPHONE INPUT connector**
This balanced XLR three connector is for microphone level only.

Pin No.	Function
1	GND
2	HOT
3	COLD

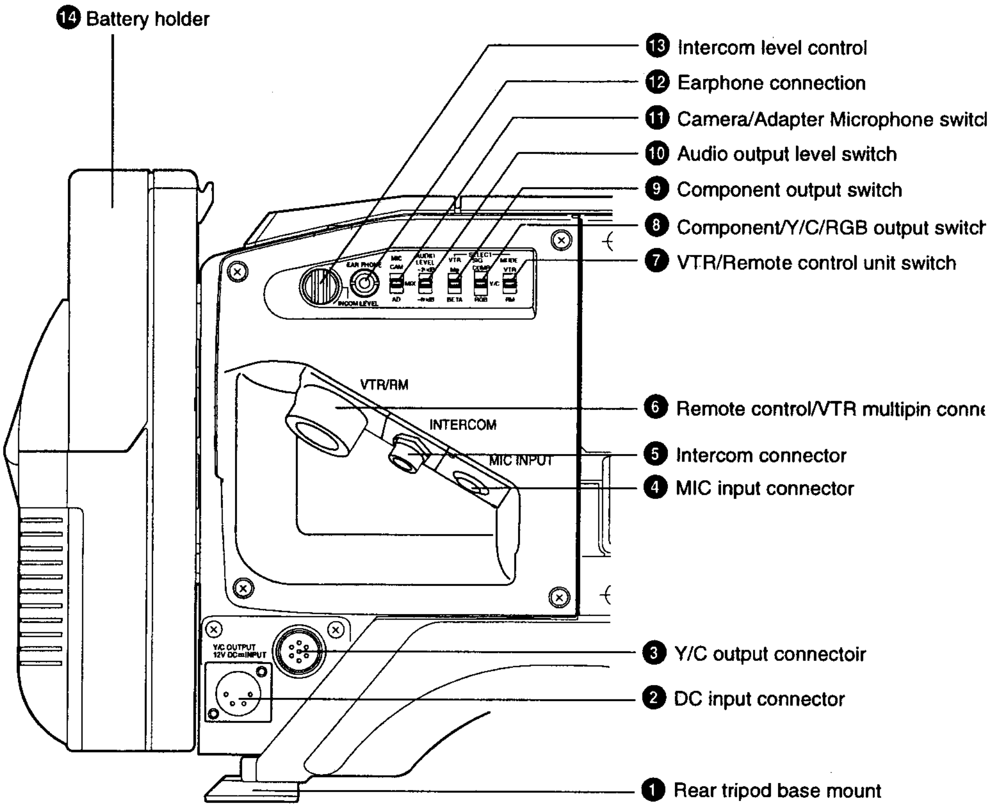
㊴ **VTR Mounting Bracket**
This is a bracket for mounting the VTR when it is attached to the unit.

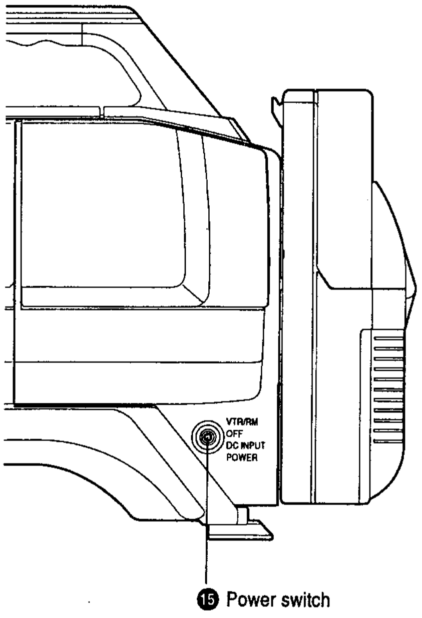
㊵ **Chest Rest Mount**
Used to install the KA-111 Chest Rest (Optional).

[Left side panel]


㊴ VTR Mounting Bracket
JVC
DIGITAL KY-D29
㊳ Microphone input connector
㊲ Microphone holder mounting screws
㊱ Character display switch
㉟ Microphone input switch
㉙ Local remote control connector
㉚ Monitor output connector
㉛ Sync signal input connector
GENLOCK INPUT
MONITOR OUTPUT
REMOTE
PHASE
DISP MIX
ON OFF
㉜ Horizontal phase control
㉝ Color sub-carrier phase control
㉞ Color sub-carrier phase coarse adjustment control
㊵ Chest rest mount

2-2 CAMERA ADAPTER (KA-27U)


⑭ Battery holder
⑬ Intercom level control
⑫ Earphone connection
⑪ Camera/Adapter Microphone switcl
⑩ Audio output level switch
⑨ Component output switch
⑧ Component/Y/C/RGB output switcł
⑦ VTR/Remote control unit switch
⑥ Remote control/VTR multipin conn‹
⑤ Intercom connector
④ MIC input connector
③ Y/C output connectoir
② DC input connector
① Rear tripod base mount
EAR PHONE
INCOM LEVEL
VTR/RM
INTERCOM
MIC INPUT
Y/C OUTPUT
12V DC INPUT


VTR/RM
OFF
DC INPUT
POWER
⑮ Power switch

① Rear tripod base mount (KY-D29)

This is one of the base mounts used to install the tripod base on the camera.

Together with the front tripod base mount, it secures the camera on the tripod base.

Reference "Mounting the camera on the tripod base" on page 24.

② [12V DC ⎓ INPUT] DC INPUT CONNECTOR

This connector is designed for 12 volts DC input.

This connector is activated by setting the POWER SWITCH ⑮ to DC INPUT, and has priority over the Battery holder ⑭.

Pin No.	Function
1	GND
2	—
3	—
4	+12V

DC In connector function

2-2 CAMERA ADAPTER (KA-27) (Cont'd)

❸ [Y/C OUTPUT] VIDEO OUTPUT

Video output is for Camera Video only, Y/C358 signal is output. Return Video from the VCR or character display on the viewfinder is not available.

Pin No.	Function
1	Y OUT
2	GND
3	—
4	—
5	C OUT
6	GND
7	—

Y/C connector function

❹ [MIC INPUT] MIC INPUT CONNECTOR

This is an input for mic level only; with an balanced XLR three pin connector.

Pin No.	Function	Input specifications
1	GND	
2	HOT	–60 dBm
3	COLD	

MIC INPUT connector function

❺ [INTERCOM] INTERCOM CONNECTOR

The connector is for remote control unit and headset of intercom.

❻ [VTR/RM] REMOTE CONTROL/VCR MULTIPIN CONNECTOR

Use to connect to a VCR or the RM-P200 and RM-P300 Camera Control Units.

❼ [MODE] VTR/REMOTE CONTROL UNIT SWITCH

VTR : Set to VTR for any kind of VCR connection.
RM : Set to Remote if RM-P300 or RM-P200 is connected.

Note :

When a portable VHS VCR is connected to the KA-27 camera adapter, the KA-27 should be adjusted internally to change the trigger mode. Please consult your local JVC-authorized service dealer.

Refer to the section 2.3.2 "MODE SELECT switch" in the KA-27's service manual (No. 60073) on page 3-1.

❽ [SIG SELECT] COMPONENT/ Y/C /RGB output switch

The signal sent through VTR / RM connector ❻ can be selected for one of these three signals in addition to composite video.

COMP : Component signals are output.
Y/C : Y/C signals are output.
RGB : RGB signals are output.

❾ [VTR SELECT] Component output switch

This switch selects the component signal output level so that the standard signal can be output according to the VCR type of MII or Beta.

This switch is valid only when the ❽ switch is set to "COMP".

MII : Set to this position when recording onto a MII VCR.
BETA : Set to this position when recording onto a Betacam VCR.

❿ [AUDIO LEVEL] Audio output level switch

The audio output level should be switched according to the VCR used for recording.

⓫ [MIC] Camera microphone/adapter microphone switch

This switch is used to select the microphone input source between the microphone mounted on the camera and that connected to the adapter.

It is not possible to record audio signals from both microphones.

CAM : The input from the camera's microphone input connector ㊳ is valid.
AD : The input from the adapter's MIC INPUT connector ❹ is valid.

⓬ [EAR PHONE] EARPHONE CONNECTOR

This connector is used to monitor the VCR audio signal and the microphone input.

The VCR must be in record/pause mode so that the camera microphone input can be monitored.

* Some VCRs for VHS only do not return the playback audio to the camera.

⓭ [INCOM LEVEL] INTERCOM LEVEL CONTROL

Controls the volume of the intercom headset connected to the Intercom connector ❺.

⓮ BATTERY HOLDER

Shown here is the standard battery holder. This can be used for Flat shape type and NB-G1 Batteries.

DC input connector ❷ has priority over this battery holder.

⓯ [POWER] POWER SWITCH

This switch chooses the type of power source and turns on the camera.

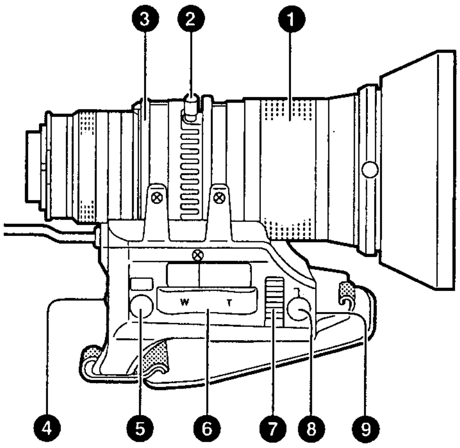
VTR/RM : Power is supplied through the Multipin Connector from an external VCR or Remote Control Unit.
OFF : Master Power Off for Camera.
DC INPUT : Power is supplied from the onboard Battery pack or DC INPUT ❷. DC INPUT has priority over the on-board battery.

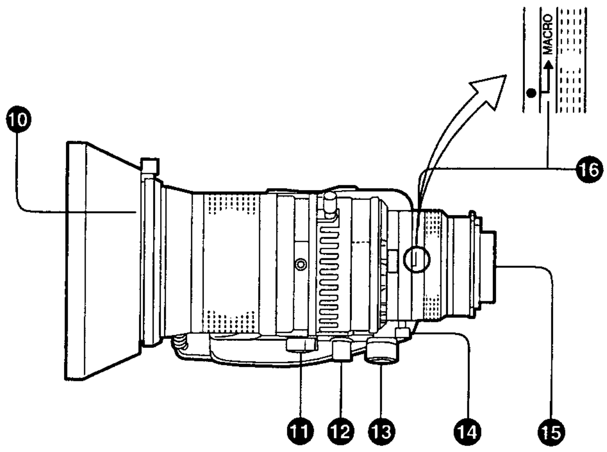
WARNING :

Do NOT unplug or plug the power while shooting, even if a battery is installed, or the image may be disturbed.

Be sure to set the Operate switch on the camera to OFF/SAVE when plugging or unplugging the power.

2-3 LENS





① **FOCUS RING**

Manual focus ring.

② **Zoom lever/ring**

This is the manual zoom ring equipped with a zoom lever. To activates the zoom feature on, turn the zoom mode knob ⑪ to position "M".

③ **IRIS RING**

Manual Irisi ring. To activate the auto iris feature, set the Iris Mode switch ⑦ to A.

④ **VTR TRIGGER BUTTON**

To start shooting push once.
To stop shooting push again.

⑤ **RETURN VIDEO (RET) BUTTON**

The return video signal from the VCR or the remote control unit when connected, can be monitored on the viewfinder only while pushing this button.

- The Viewfinder Status display is not available during this operation.

⑥ **ZOOM SERVO CONTROL LEVER**

Pushing this lever in the W direction makes the lens move wider.
Pushing this lever in the T direction makes the lens move tighter. Pushing harder changes the speed of the Zoom. To operate the servo zoom feature with this lever, set the ZOOM MODE switch ⑪ to S.

⑦ **IRIS MODE SWITCH**

A : Activates the auto iris feature.
M : Allows manual iris control.

⑧ **MOMENTARY AUTO IRIS BUTTON**

When the IRIS MODE switch is at M, pushing this button activates the Auto Iris Function while it is held down only.

⑨ **IRIS SPEED ADJUSTING BUTTON**

Adjusts the iris operation speed.

⑩ **FILTER SCREW**

Protect the lens with a Clear or UV filter by screwing on to the front inside of the lens hood.
Other filters can be used for various effects.

⑪ **ZOOM MODE KNOB**

S : Servo Zoom mode. Allows operation by the Zoom Servo Control lever ⑥.
M : Manual Zoom mode. Allows zoom control by the Zoom lever/ring ②.

⑫ **REMOTE FOCUS CONTROL CONNECTOR**

To connect with an optional focus servo unit.

⑬ **ZOOM SERVO CONNECTOR**

Connect with an optional zoom servo unit.

⑭ **BACK FOCUS RING / FIXING SCREW**

For Set-up Back Focus adjustment only.
Secure with the Screw knob after adjustment.

⑮ **REAR LENS SURFACE**

Protect with special cover.

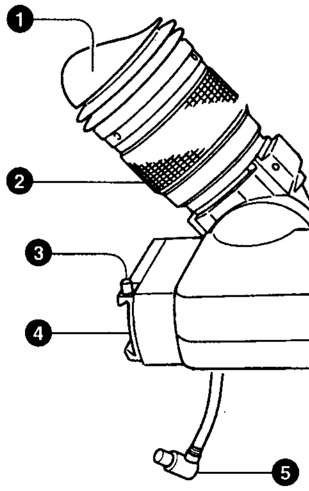
⑯ **Macro focusing ring (for close-up shooting)**

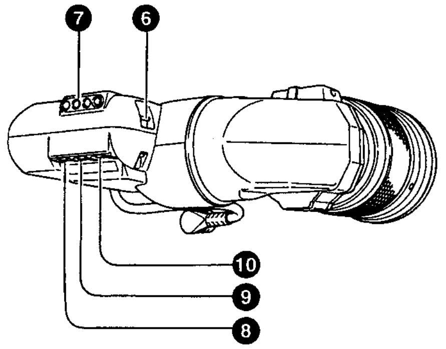
By rotating this ring in the direction of the arrow, the lens becomes capable of close-up shooting of very small object.
Normal focus adjustment and zooming are not available in the macro mode.
To shoot images in the macro mode, set the focus ring to the infinite position and the zoom ring to the widest angle position.
To adjust the focus of the macro image, rotate this ring in the direction of arrow until the object is focused.

CAUTION :

The back-focus knob is located close to the macro ring, be careful not to mistake the back-focus knob for the macro ring. After the required operation, be sure to return the macro ring to the normal position.

2-4 VIEWFINDER (VF-P116)





❶ **EYEPIECE**

Blocks light to viewfinder screen and holds eye optics. The Eyepiece can be opened to view the screen directly.

❷ **Eyepiece focusing ring**

Rotate this ring to adjust the viewing angle.
Be sure to adjust this ring because the viewing angle affects the lens focus adjustment.
To perform more reliable focus adjustment, it is recommended to turn on the contour with the PEAKING control ❽.

❸ **STOPPER SCREW**

This stopper screw prevents the viewfinder from coming off the camera.

❹ **VIEWFINDER SHOE**

Attaches to the Viewfinder Mount base on camera.

❺ **CABLE**

Connect to camera viewfinder connector.

❻ **TALLY SWITCH**

Set this switch to off if you do not want to inform the subjects by the Tally light that they are being recorded.
ON : Lights the Tally lamp ❼ during recording.
OFF : Does not light the Tally lamp ❼.
However, the REC lamp at the eyepiece will not turn off.

❼ **TALLY LIGHT**

Lights when recording is in progress.
The light does not come on when the Tally Switch ❻ is at "OFF".

❽ **[PEAKING] Peaking (contour) control**

Rotate to adjust the contour of the viewfinder screen image.

❾ **[CONT] CONTRAST**

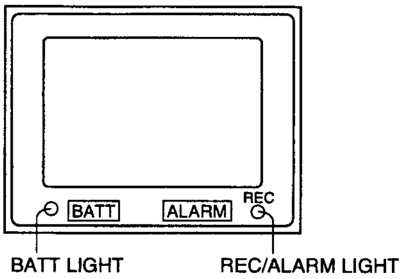
Controls the level of Viewfinder contrast.

❿ **[BRIGHT] BRIGHTNESS**

Controls the level of Viewfinder brightness.

2-5 VIEWFINDER DISPLAY

Warning indicators inside the viewfinder

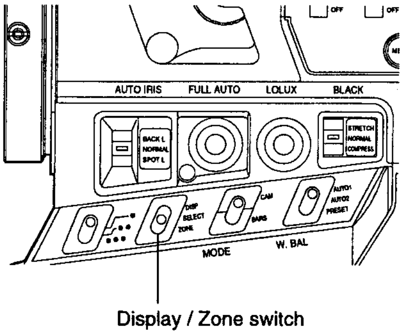

BATT
ALARM
REC
BATT LIGHT
REC/ALARM LIGHT

The viewfinder has two LED indicators below the screen. These LEDs light or blink to indicate the present status of the camera or the VCR's camera control unit.

- **[BATT] BATTERY LIGHT**
  This blinks red when battery voltage becomes too low for the camera to operate.
  - Some VCRs signal low battery with the REC/ALARM light.
- **REC/ALARM LIGHT**
  This light green for these conditions.
  Solid Green : While recording.
  Blinks Green : • While the VCR prerolls before recording.
  - If the Tape is finishing.
  - If the VCR Malfunctions
  - For some VCRs this indicates Low Battery.

Note :
With some VCRs, the REC indicator may turn off when the green tally blinks during recording. In this case, the accumulating timer does not operate.

Viewfinder screen display

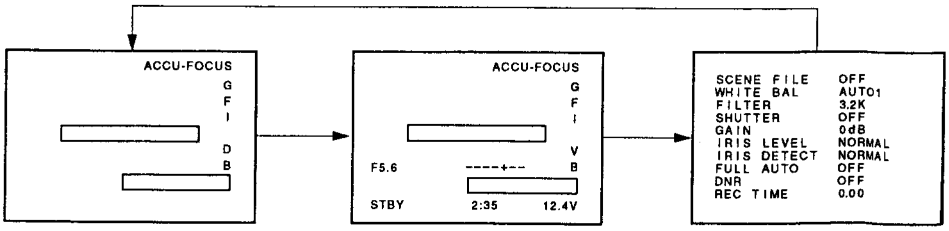

OFF
OFF
AUTO IRIS
FULL AUTO
LOLUX
BLACK
BACK L
NORMAL
SPOT L
STRETCH
NORMAL
COMPRESS
DISP SELECT ZONE
CAM
BARS
AUTO1
AUTO2
PRESET
MODE
W. BAL
Display / Zone switch

The viewfinder screen displays the following information:

1. Status screens (screens for use in checking the current camera setup)
2. Alarm message display
3. Safety zone display
4. Setting screen (screen for use in the camera setup including the date)
5. Auto white balance display
6. Shutter speed display
7. TIME DATE display

1. STATUS SCREENS

To display the status screens on the viewfinder screen, push the Display/Zone switch upward. One of the three kinds of status screen can be displayed every time the switch is pushed upward.

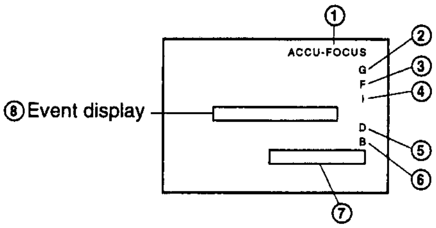

ACCU-FOCUS
G
F
I
D
B
ACCU-FOCUS
G
F
I
V
B
F5.6
----+--
STBY
2:35
12.4V

SCENE FILE	OFF
WHITE BAL	AUTO1
FILTER	3.2K
SHUTTER	OFF
GAIN	0dB
IRIS LEVEL	NORMAL
IRIS DETECT	NORMAL
FULL AUTO	OFF
DNR	OFF
REC TIME	0.00

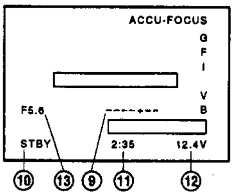
Status 0 Status 1 Status 2

2. CONTROLS, CONNECTORS AND INDICATORS

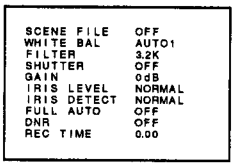
2-5 VIEWFINDER DISPLAY (Cont'd)



Status 0



Status 1



```
SCENE FILE     OFF
WHITE BAL      AUTO1
FILTER         3.2K
SHUTTER        OFF
GAIN           0dB
IRIS LEVEL     NORMAL
IRIS DETECT    NORMAL
FULL AUTO      OFF
DNR            OFF
REC TIME       0.00
```

Status 2

■ Status 0

	Display	Function
①	ACCU-FOCUS	Displayed during ACCU-FOCUS operation.
	S	Displayed when the Shutter or V. Scan is ON.
	FAS	Displayed when the Full Auto Shooting is ON.
	ALC	Indicator which appears when the individual ALC is ON.
②	G	Displayed in other modes than 0 dB, LOLUX and ALC.
	L	Displayed during LOLUX/S.LOLUX operation.
③	F	Displayed when the FAW is ON.
④	I	Displayed when the Auto iris level is set to the back light or spotlight operation.
⑤	D	Displayed when the DNR switch is set to ON or AUTO.
⑥	B	Displayed when the black stretch or black compression switch operation.
⑦	Time/Date display	Reference Page 40.
⑧	Event display	See right-hand figure.

■Status 1

In addition to the information on the status 0 screen, this screen displays information on the audio indicator, accumulated recording time, voltage and lens F number.

Display position	Display	Function
⑨	- - - - + - -	Audio indicator. Bar is Indicated
⑩	STBY REC SAVE No display	VCR in standby mode VCR in record mode VCR in save mode Others
⑪	(Example) 2:35	Accumulated recording time (ACCUM) The counting limit is 999 min. 59 sec. After this, the accumulated count restarts from 0 min. 00 sec.
	< 10 (< 5)	Remaining tape time (REMAIN) This is displayed when the remaining amount of tape drops below 10 minutes (with a camcorder-type configuration using S-VHS). With certain VCRs, this information is displayed when the remaining amount of tape drops below 5 minutes. * The TAPE NEAR END and TAPE END indicators are shown at alarm display position ③ on page 17.
	The accumulated recording time (ACCUM) and the remaining tape time (REMAIN) information can be switched with the menu item "REC TIME" in the Advance Menu. See page 42.	
⑫	12.4 V (for example)	Voltage display (in 0.1 V steps).
⑬	F1.4, F2, F2.8, F4, F5.6, F8, F11, F16, CLOSE	

■ Event display

is displayed for only about 2 seconds on the viewfinder screen when any of the following switches is operated.

Switch	Event Display Contents	
ZEBRA	ZEBRA	ON, OFF
BLACK STRETCH/ BLACK COMPRESS	BLACK	STRETCH, NORMAL, *COMPRESS
GAIN	GAIN	-3 dB, 0 dB, 6 dB, 9 dB, 12 dB, 18 dB, ALC
W.BAL	W.BAL	AUTO 1, AUTO 2, PRESET, FAW
FULL AUTO	FULL AUTO	ON, OFF
IRIS	IRIS	BACK.L, NORMAL, SPOT.L
LOLUX	LOLUX	ON, OFF
DNR	DNR	ON, AUTO, OFF
FILTER control	FILTER	3.2K, 5.6K, 5.6K+ND, EFFECT
FILE	SCENE	FILE A, B, OFF

■ Status 2

This screen displays the camera setup.

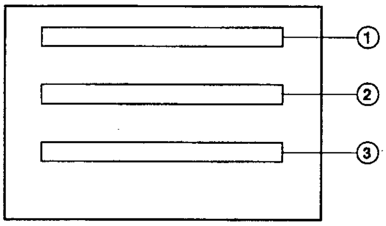
Display position	Display Contents
SCENE FILE	A, B, OFF
WHITE BAL	AUTO 1, AUTO 2, PRESET, FAW, *MANUAL
FILTER	3.2K, 5.6K, 5.6K+ND, EFFECT
SHUTTER	NORMAL, 1/100 (NTSC), 1/120 (PAL), 1/250, 1/500, 1/1000, 1/2000, V.SCAN level, EEI (in ALC mode)
GAIN	–3 dB, 0 dB, 3 dB, 6 dB, 9 dB, 12 dB, 18 dB, LOLUX, ALC
IRIS LEVEL	BACK.L, NORMAL, SPOT.L
FULL AUTO	ON, OFF
DNR	OFF, AUTO, ON
REC TIME	Tape remaining time or ACCUmulated recording time

* Displayed only during the setup operation from the remote control unit.

⑩, ⑪, and ⑫ are not displayed when the camera head is connected with RM-P200, RM-P300, and RM-P270.

2-5 VIEWFINDER DISPLAY (Cont'd)

2. Alarm message display



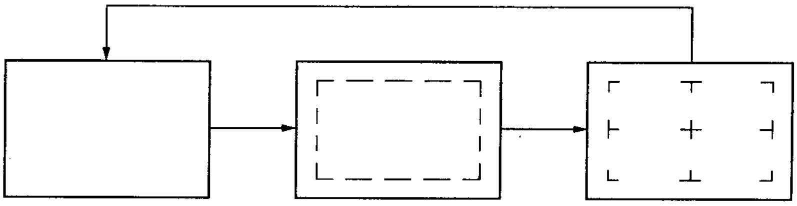
The following alarm messages are displayed on the status 0 and status 1 screens.

Display position	Display	Contents
①	LOW BATTERY	The battery capacity is nearly exhausted.
②	VCR WARNING VCR OP MISS	VCR error VCR operation mistake.
③	TAPE NEAR END TAPE END	The remaining tape time has dropped below 3 minutes. The end of the tape has been reached.

Note :
Some messages may not be displayed depending on the type of VCR.

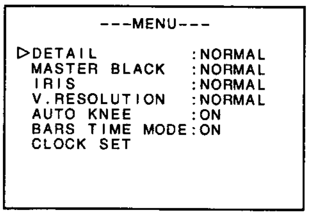
3. Safety zone display

To display the safety zones on the viewfinder screen, push the DISPLAY/ZONE switch downward. One of the three kinds of safety zones can be displayed every time the switch is pushed downward.



Mode 0 Mode 1 Mode 2

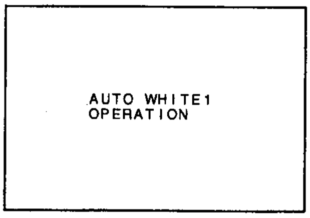
4. Setting the screen display



```
---MENU---
▷DETAIL          :NORMAL
 MASTER BLACK    :NORMAL
 IRIS            :NORMAL
 V.RESOLUTION    :NORMAL
 AUTO KNEE       :ON
 BARS TIME MODE:ON
 CLOCK SET
```

Screen for use in the date setting and other camera setups.
Reference "FLOW OF Menu screen" on page 38.

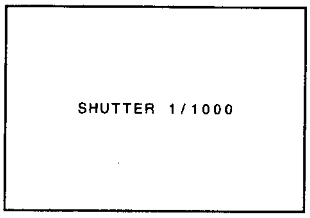
5. Auto white balance display



```
AUTO WHITE1
OPERATION
```

This screen appears during the auto white balance adjustment operation to display various data.
Reference "White balance adjustment" on page 34.

6. Shutter speed display



```
SHUTTER 1/1000
```

When the SHUTTER is on, a shutter speed is displayed. (for approx. 5 sec.)
Also, whenever the shutter speed is altered by using the UP/DOWN button, the shutter speed is displayed.
While this is displayed, other displays disappear.
Reference [SHUTTER] on page 8.

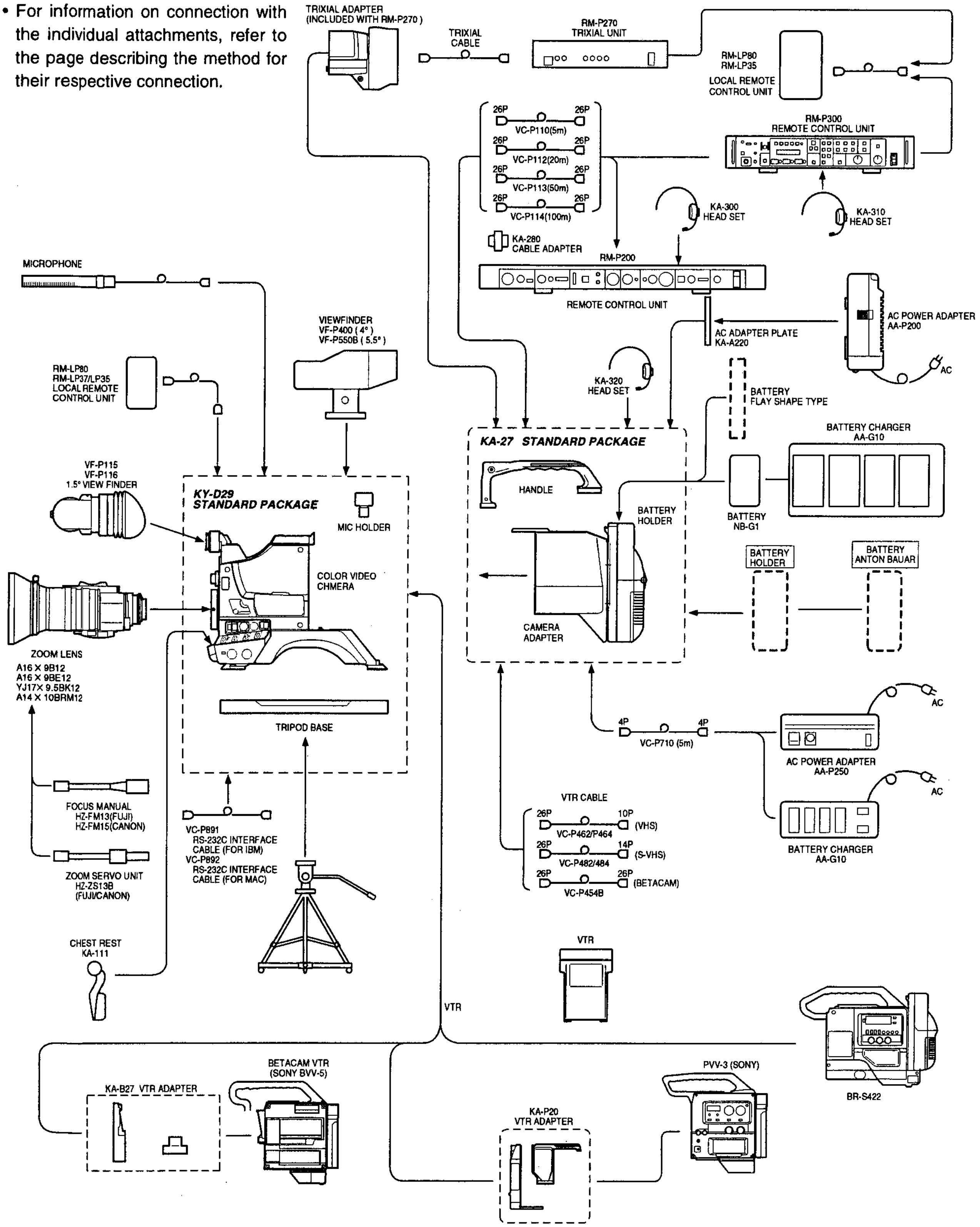
7. TIME DATE display

Pressing the SET button will display the time and date. If you press it again, the display will disappear.

3. BASIC SYSTEM CONNECTIONS AND ADJUSTMENTS

3-1 BASIC SYSTEM

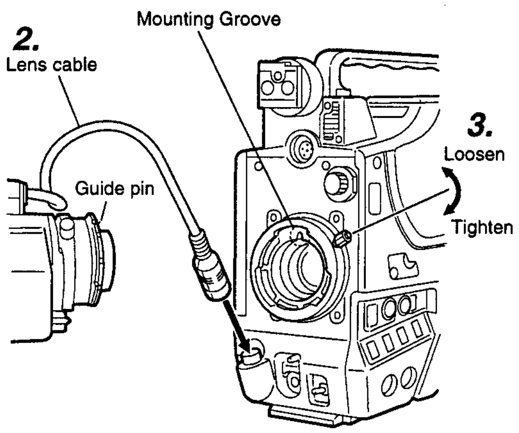
- For information on connection with the individual attachments, refer to the page describing the method for their respective connection.


TRIXIAL ADAPTER
(INCLUDED WITH RM-P270)
TRIXIAL CABLE
RM-P270
TRIXIAL UNIT
RM-LP80
RM-LP35
LOCAL REMOTE CONTROL UNIT
26P
26P
VC-P110(5m)
VC-P112(20m)
VC-P113(50m)
VC-P114(100m)
RM-P300
REMOTE CONTROL UNIT
KA-300
HEAD SET
KA-310
HEAD SET
KA-280
CABLE ADAPTER
RM-P200
REMOTE CONTROL UNIT
MICROPHONE
AC POWER ADAPTER
AA-P200
AC ADAPTER PLATE
KA-A220
AC
VIEWFINDER
VF-P400 (4°)
VF-P550B (5.5°)
RM-LP80
RM-LP37/LP35
LOCAL REMOTE
CONTROL UNIT
KA-320
HEAD SET
BATTERY
FLAY SHAPE TYPE
BATTERY CHARGER
AA-G10
KA-27 STANDARD PACKAGE
VF-P115
VF-P116
1.5° VIEW FINDER
KY-D29
STANDARD PACKAGE
MIC HOLDER
HANDLE
BATTERY
HOLDER
BATTERY
NB-G1
BATTERY
HOLDER
BATTERY
ANTON BAUAR
COLOR VIDEO
CHMERA
CAMERA
ADAPTER
ZOOM LENS
A16 X 9B12
A16 X 9BE12
YJ17X 9.5BK12
A14 X 10BRM12
TRIPOD BASE
4P
4P
VC-P710 (5m)
AC
AC POWER ADAPTER
AA-P250
AC
VTR CABLE
26P
10P
(VHS)
VC-P462/P464
26P
14P
(S-VHS)
VC-P482/484
26P
26P
(BETACAM)
VC-P454B
BATTERY CHARGER
AA-G10
FOCUS MANUAL
HZ-FM13(FUJI)
HZ-FM15(CANON)
VC-P891
RS-232C INTERFACE
CABLE (FOR IBM)
VC-P892
RS-232C INTERFACE
CABLE (FOR MAC)
ZOOM SERVO UNIT
HZ-ZS13B
(FUJI/CANON)
CHEST REST
KA-111
VTR
VTR
BETACAM VTR
(SONY BVV-5)
KA-B27 VTR ADAPTER
PVV-3 (SONY)
BR-S422
KA-P20
VTR ADAPTER

Refer to the section 2.6.4 “Dynamic shading adjustment” on page 2-10.

3-2 INSTALLING THE BASIC SYSTEM

LENS INSTALLATION


2.
Lens cable
Mounting Groove
Guide pin
3.
Loosen
Tighten

1. Remove the mount cap. Be careful there is no dust left inside the mount.

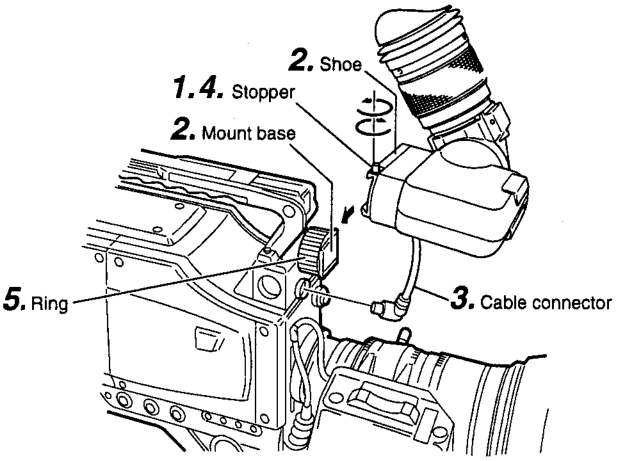
2. Connect the lens cable to the camera body.

3. Align the groove in the mount with the guide pin on the lens. Turn the lens-secure lever clockwise so the lens is secured firmly on the lens mount.

Note :

- Be sure tighten the lens completely, otherwise the back focus adjustment may be incorrect.
- Shading may occur at the top and bottom of the screen depending on which lens is employed. In this case, a readjustment inside the camera is necessary.
  Consult with your local JVC authorized service dealer when this occurs.

VIEWFINDER INSTALLATION


2. Shoe
1.4. Stopper
2. Mount base
5. Ring
3. Cable connector

1. Loosen the stopper screw.

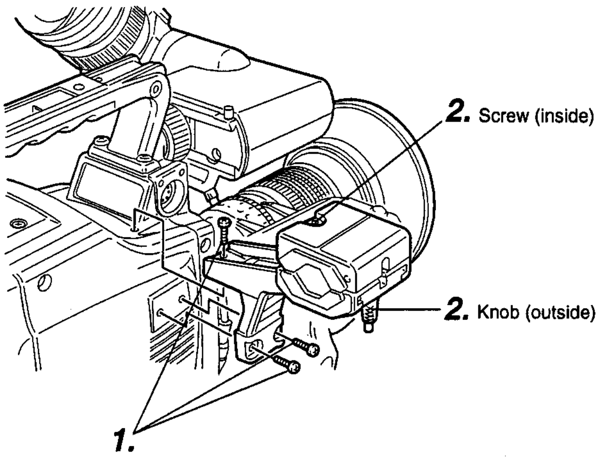
2. Attach the viewfinder with its shoe aligned with the Mount base.

3. Connect the cable.

4. Tighten the stopper screw.

5. Tighten the ring.

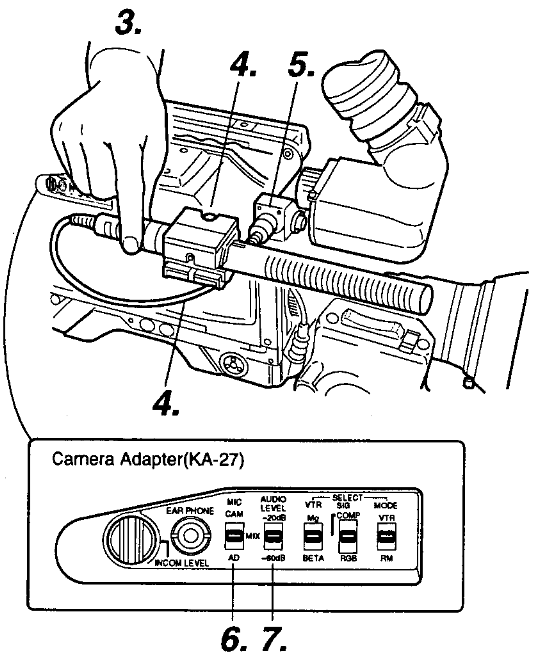
MICROPHONE INSTALLATION


2. Screw (inside)
2. Knob (outside)
1.

1. Install the provided microphone holder onto the camera head using the 3 screws.

2. Loosen the innermost screw and also rotate the outer knob by rotating it. Pull the knob outward to open the microphone holder.

3-2 INSTALLING THE BASIC SYSTEM (Cont'd)


3.
4.
5.
4.
Camera Adapter(KA-27)
EAR PHONE
INCOM LEVEL
MIC
CAM
MIX
AD
AUDIO
LEVEL
-20dB
-60dB
SELECT
VTR
Mg
BETA
SIG
COMP
RGB
MODE
VTR
RM
6.
7.

3. Set the microphone in the specified position paying attention to the left and right.

4. Secure the microphone onto the microphone holder by tightening the innermost screw and the outer knob so that the holder is horizontal.

5. Connect the microphone cable to the microphone input connector.

6. When the camera adapter (KA-27) is used, set the CAMERA/ADAPTER MIC switch properly.
CAM : When the microphone is connected to the microphone input connector of the camera head.
AD : When the microphone is connected to the 3-pin XLR MIC INPUT connector of the camera adapter.

7. When the camera adapter (KA-27) is used, set the AUDIO OUTPUT LEVEL switch according to the rated input level of the portable VCR.

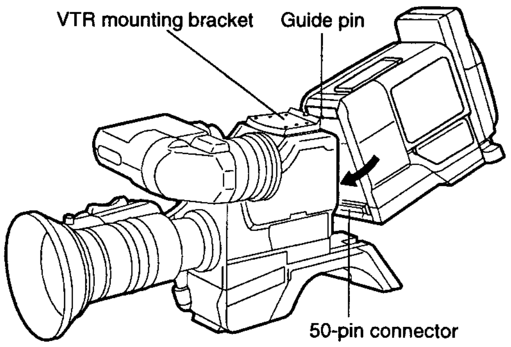
- **Monaural recording**

Monaural audio is recorded only on the VCR L channel.

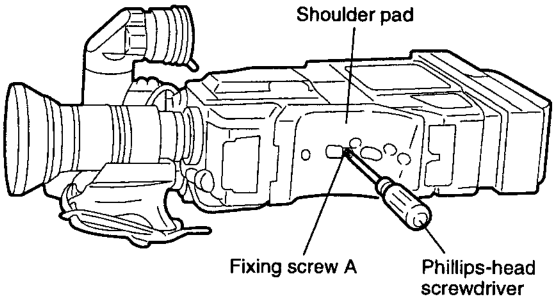
3-2 INSTALLING THE BASIC SYSTEM (Cont'd)

CONNECTION WITH A DOCKABLE VCR

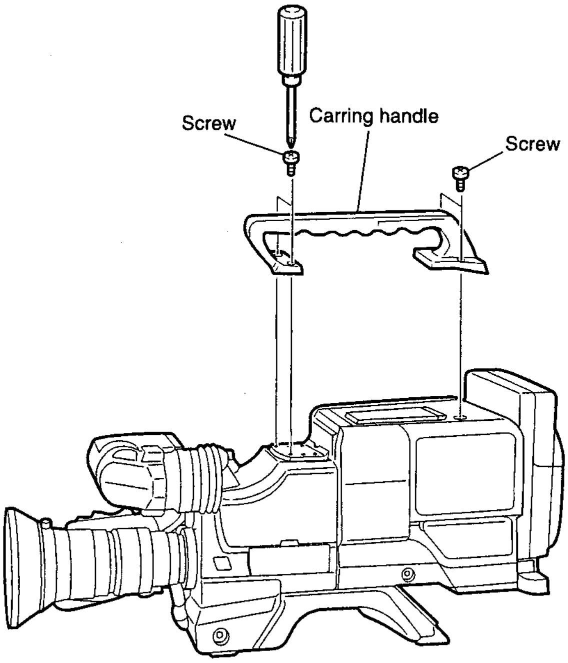
■ BR-S422U VCR ATTACHMENT


VTR mounting bracket
Guide pin
50-pin connector

1. Align the BR-S422U's guide pin with the V groove of the camera's VCR mounting bracket after removing the cap of the 50-pin connector. Securely engage the BR-S422U's 50-pin connector to the camera's.


Shoulder pad
Fixing screw A
Phillips-head screwdriver

2. Secure the BR-S422U to the camera by inserting the fixing screws A through the camera's shoulder pad, using a Phillips screwdriver.

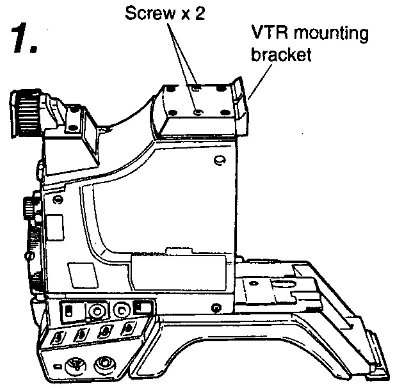

Screw
Carring handle
Screw

3. Secure the provided carrying handle with the BR-S422U to the camera and the BR-S422U with four screws, using a Phillips screwdriver as illustrated.

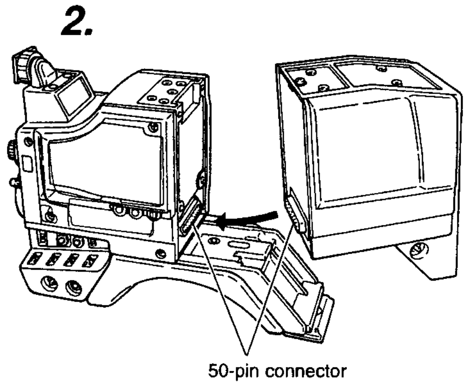
3-2 INSTALLING THE BASIC SYSTEM (Cont'd)

Connection with the camera adapter (KA-27)

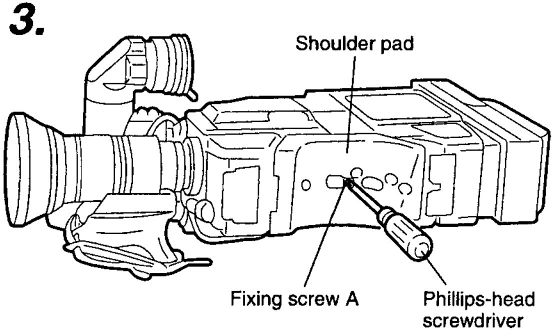
The KA-27 camera adapter should be installed on the camera head when a portable VCR or camera control unit is to be used.


1.
Screw x 2
VTR mounting bracket

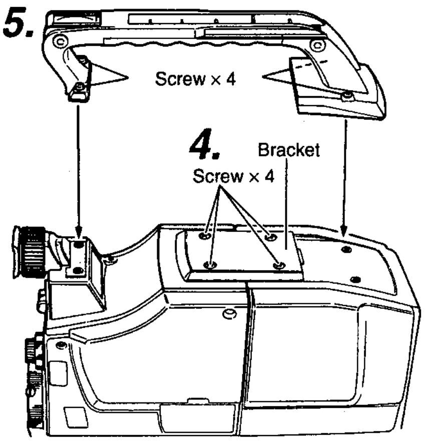
1. Remove the VCR mounting bracket to be used in the camcorder connection by loosening the 2 screws.


2.
50-pin connector

2. Attach the KA-27 to the rear of the camera head as if sliding the camera adapter on BOTTOM FRAME and plug in the 50-pin connector.


3.
Shoulder pad
Fixing screw A
Phillips-head screwdriver

3. Secure the KA-27 to the camera by inserting the fixing screws A through the camera's shoulder pad, using a Phillips screwdriver.


5.
Screw x 4
4.
Bracket
Screw x 4

4. Secure the bracket provided with the KA-27 onto it using the 4 screws provided.

5. Attach the handle across the camera head and KA-27 using the 4 screws provided.

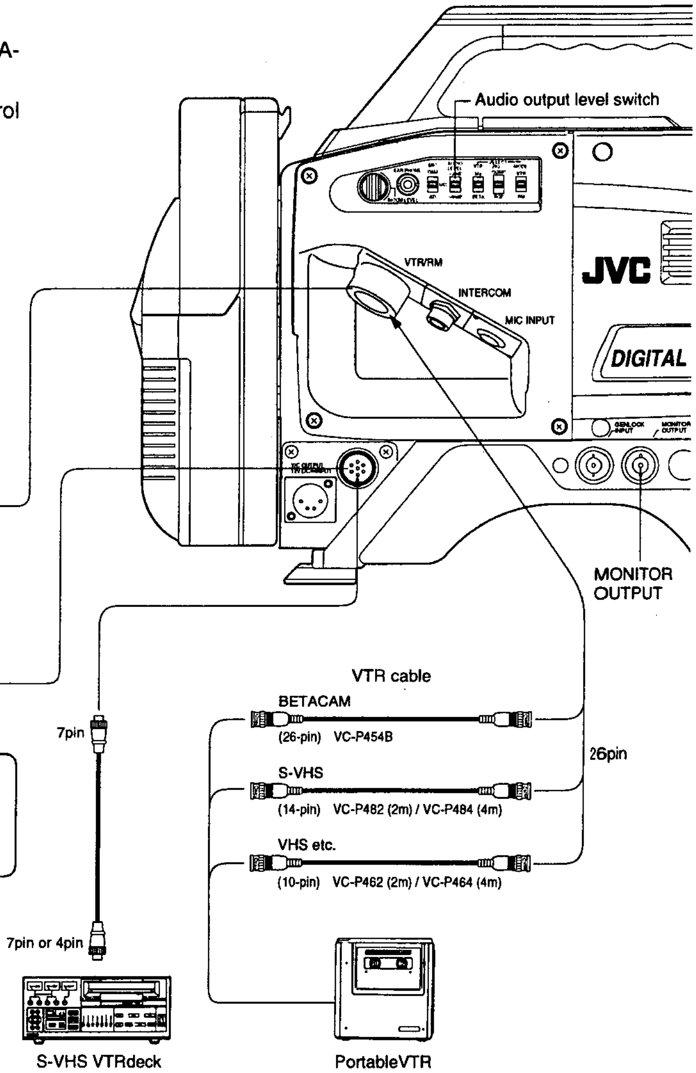
3-2 INSTALLING THE BASIC SYSTEM (Cont'd)

CONNECTION WITH A PORTABLE VCR

The KA-27 Camera adapter allows the Stand-alone use of the camera:
To power the camera so as to supply video directly from the KA-27 Y/C video output or the camera's Monitor output connector.
To connect directly to a Portable VCR or Remote Camera Control Unit through the VCR multipin connector.

■ CONNECTIONS

Before connections
Be sure to turn off the power while making connections.


Audio output level switch
VTR/RM
INTERCOM
MIC INPUT
JVC
DIGITAL
MONITOR OUTPUT
VTR cable
BETACAM
(26-pin) VC-P454B
S-VHS
(14-pin) VC-P482 (2m) / VC-P484 (4m)
VHS etc.
(10-pin) VC-P462 (2m) / VC-P464 (4m)
26pin
7pin
7pin or 4pin
S-VHS VTRdeck
PortableVTR

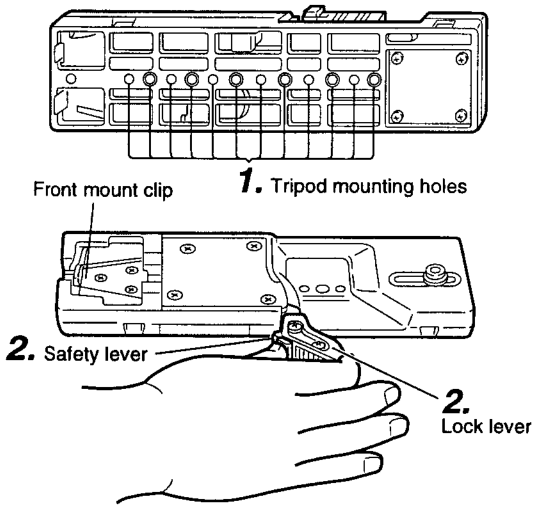
VTR/RM MULTIPIN CONNECTOR
See the chart for proper cables for different VTRs.

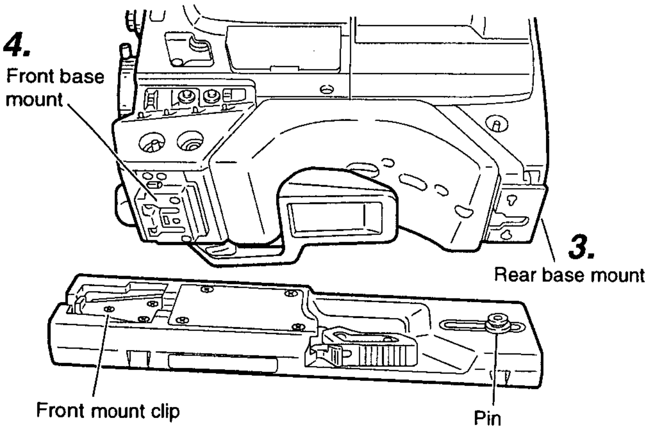
Y/C OUTPUT CONNECTOR
Y/C358 video signal is output

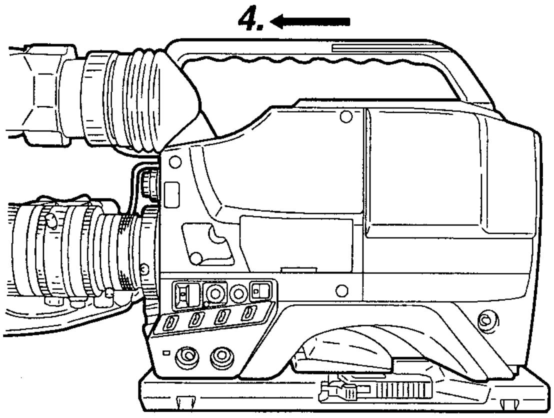
Note :
When S-VHS portable VCR is connected, it is recommended to use –20 dB audio output on camera adapter and H input level (–20 dB) on VCR.

3-2 INSTALLING THE BASIC SYSTEM (Cont'd)

TRIPOD INSTALLATION


Front mount clip
1. Tripod mounting holes
2. Safety lever
2. Lock lever


4. Front base mount
3. Rear base mount
Front mount clip
Pin



The camera can be mounted on a tripod by means of the tripod base provided.

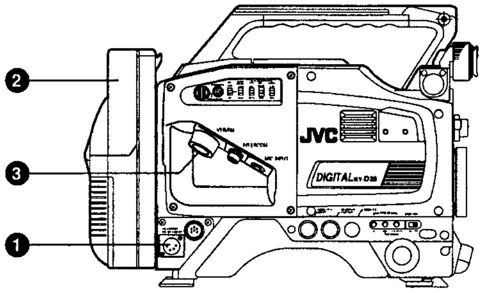
1. Attach the tripod base on the tripod by using the hole which balances the camera most optimally.
2. While pushing the safety lever, pull the lock lever toward the front until the front mount clip clicks into place.
3. Place the camera on the tripod base by aligning the rear base mount of the camera with the pin on the tripod base.
4. Push the camera from the upward direction and slide it toward the front so that the front base mount of the camera is locked by the front mount clip of the tripod base as it clicks into place.

CAUTION :

The front base mount may be locked while the pin of the tripod base is not inserted into the hole on the rear base mount of the camera. Therefore, after mounting, make sure that these parts are engaged properly.

3-3 POWER SUPPLY PREPARATION

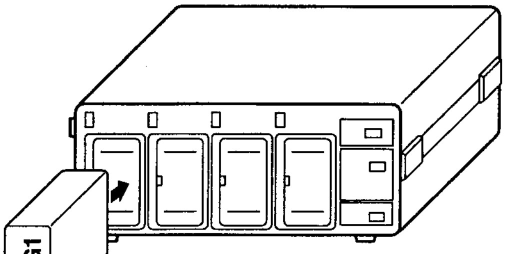
- **Connection with KA-27**



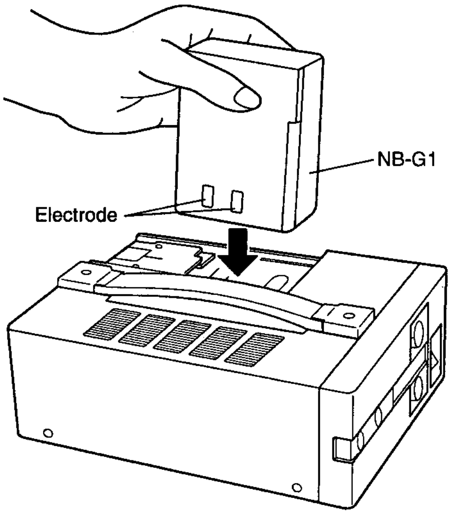
The power to the camera can be supplied with any of the 5 methods listed below.

- When the power supply select switch of the KA-27 camera adapter or camcorder-type VCR is set to DC INPUT:
  - Power supply from the AC adapter to❶
  - Power supply from the DC 12 V battery to❶
  - Power supply from the battery pack in the KA-27 or camcorder-type VCR to❷
- When the power supply select switch of the KA-27 is set to VTR/RM :
  - Power supply from the remote control unit to❸
  - Power supply from the portable-type VCR to❸

BATTERY PACK OPERATION



Battery charge
AA-G10U

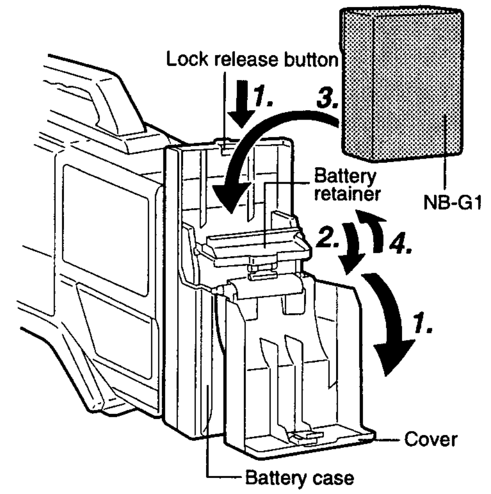


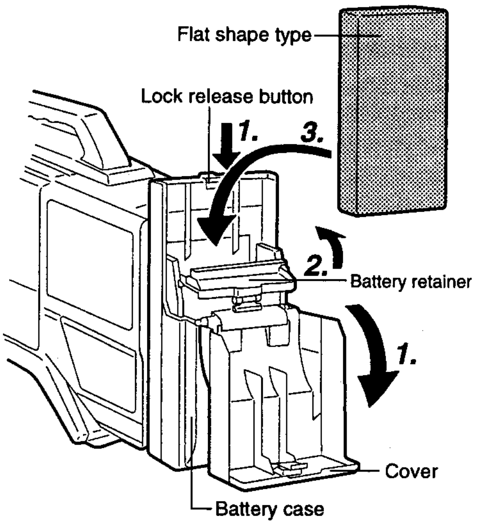
Battery charge
AA-P250

■ Tips for battery pack operation

- With a NiCd battery pack such as the NB-G1 and Flat shape type, the available operating time may be reduced by the use of the memory function.
  For details of each battery pack, please read the instruction manual of your battery.
- The viewfinder's green LED indicator alarm signals a drop in the VCR battery voltage while the red LED indicator and a character message alarm signals a drop in the camera battery voltage. Replace the corresponding battery pack whenever any of these alarms is given.
- Before recording, recharge the battery pack. Several battery packs should be kept charged according to the length of time shooting in the field.
  For NB-G1 batteries the AA-G10U sequential charger can handle the successive charging of 4 batteries. The AA-P250 is capable of recharging a single battery pack.
- Press the DISPLAY/ZONE switch upward, the Battery level can be monitored using the STATUS 1 DISPLAY.
  Note that the camera does not work at voltages under 10.5V.
  Reference : "VIEWFINDER DISPLAY" on page 15.
- Do not leave the battery pack in a place subject to high temperatures.
- Keep batteries warm (around 20°C) when shooting under cold conditions.

3-3 POWER SUPPLY PREPARATION (Cont'd)


Lock release button
1.
3.
Battery retainer
NB-G1
2.
4.
1.
Cover
Battery case

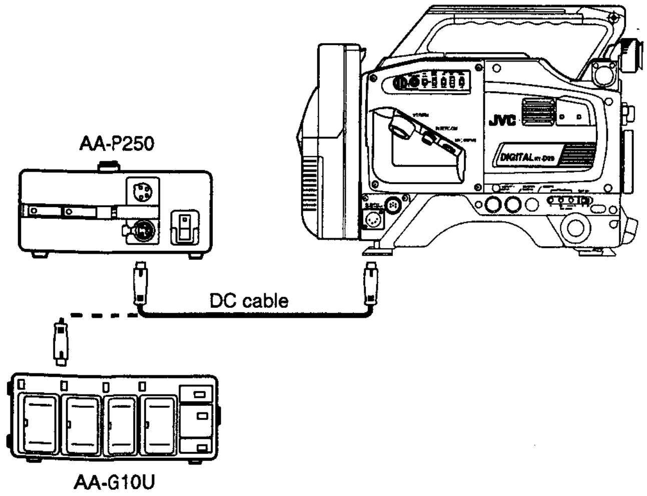

Flat shape type
Lock release button
1.
3.
2.
Battery retainer
1.
Cover
Battery case

1. Press the Lock release button to open the cover.
2. For NB-G1 use swing out the battery retainer. For Flat shape type use the retainer should be shut.
3. Install the battery pack with the terminals facing the camera.
4. With NB-G1 batteries close the battery retainer, and then close the cover.
   For Flat shape type batteries close the cover.

■ TYPICAL BATTERY POWER USAGE

A typical docked VCR can use between 8.5W and 16W DC power. An average 2.2 Ampere/Hour NB-G1 battery should last about 30 minutes based on the VCR.
Additional use of the Lens Zoom will reduce battery life.
Additional use of the Save function will extend battery life.

Power supply using the AA-P250/AA-G10

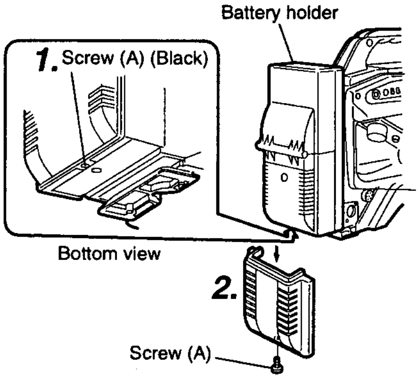

AA-P250
DC cable
AA-G10U

1. Connect the AA-P250 or AA-G10U power to the KA-27 camera adapter or the VCR using the 4 pin power cable supplied with the AC power adapter.
2. Set the Charge/Camera switch on the AA-P250 to "Camera". Press the "VCR" button on the AA-G10U.
3. Turn the AA-P250 or AA-G10U power switch to ON.
4. Set the Master Power Switch on the KA-27 or VCR to "DC INPUT".
   It is normally advisable for AC power to use the AA-P250 or AA-G10U Power supply.
   AA-P250 power consumption : DC12V maximum 3A
   AA-G10U power consumption : DC12V maximum 4A

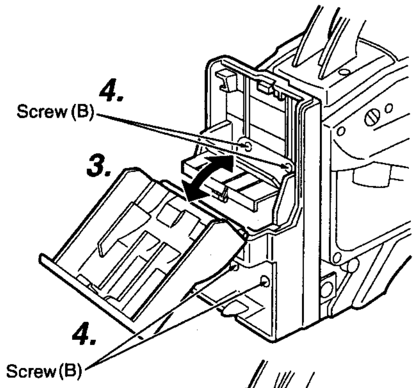
3-3 POWER SUPPLY PREPARATION (Cont'd)

Power supply using the AA-P200

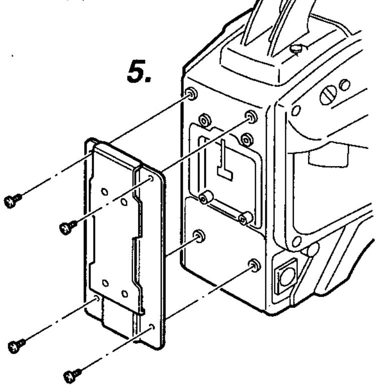
The AA-P200 AC adapter can be mounted onto the KA-27 camera adapter by means of the KA-A220 AC adapter plate (optional).


Battery holder
1. Screw (A) (Black)
Bottom view
2.
Screw (A)

1. Remove the black screw (A) from the bottom of the battery holder.
2. Remove the lower half of the battery holder cover by sliding it downward.

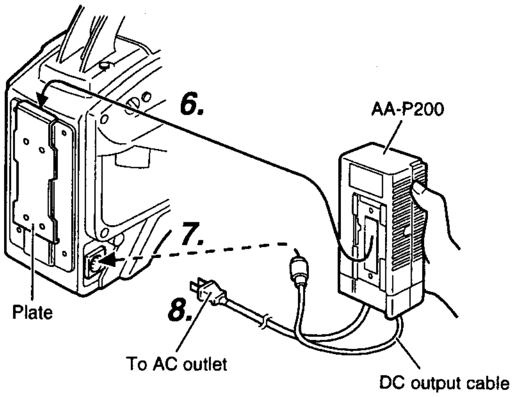

4.
Screw (B)
3.
4.
Screw (B)

3. Open the battery cover and Battery Holder Cover.
4. Remove the 4 screws (B) and unplug the connector between the camera adapter and the battery holder.



5. Remove the battery holder and attach the KA-A220 AC adapter plate using the 4 screws provided with the KA-27.

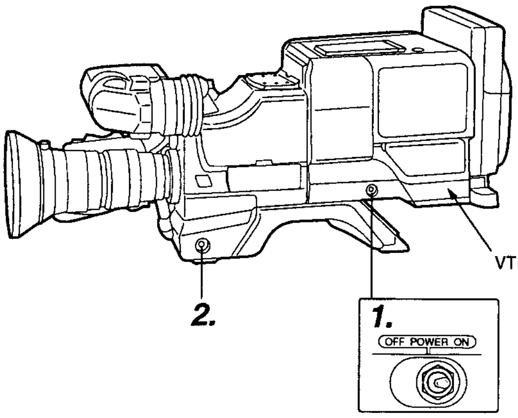
CAUTION :
Be careful not to pinch the connector cable from the camera adapter.


6.
AA-P200
7.
Plate
8.
To AC outlet
DC output cable

6. Attach the AA-P200 AC power adapter to the KA-A220 AC adapter plate.
7. Plug the DC output cable into the DC INPUT connector of the camera adapter.
8. Plug the AC cord of the AA-P200 into a 120 V AC commercial power outlet. Then, turn on the power switch.

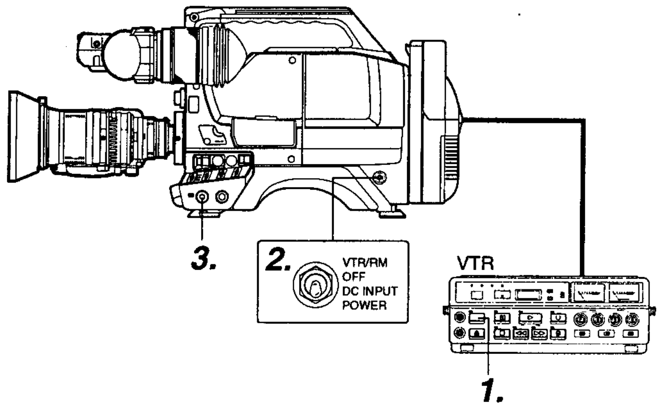
3-3 POWER SUPPLY PREPARATION (Cont'd)

How to turn the power ON


VTR
2.
1.
OFF POWER ON

■ Camcorder type system

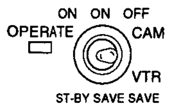
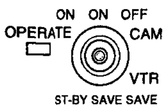
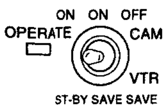
1. Set the power switch of the VCR to ON. This turns on both the VCR and the camera.
2. Set the OPERATE switch of the camera head to ON SAVE or ON ST-BY.
   The camera is turned ON and video is output at the viewfinder.


3.
2.
VTR/RM
OFF
DC INPUT
POWER
VTR
1.

■ Portable VCR system

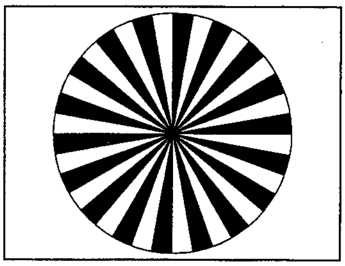
1. Set the power switch of the VCR or camera control unit to ON. This turns the VCR on.
2. Set the POWER switch of the KA-27 camera adapter to VTR/RM. The camera is turned ON.
3. Set the OPERATE switch of the camera to ON SAVE or ON ST-BY.
   The camera is turned ON and video is output at the viewfinder.

Functions of the OPERATE switch of the camera head

Switch	Setting	Function
 ON ON OFF OPERATE CAM VTR ST-BY SAVE SAVE	CAM (Camera) - OFF VTR ———— SAVE	Both the camera and VCR are turned off.
 ON ON OFF OPERATE CAM VTR ST-BY SAVE SAVE	CAM (Camera) - ON VTR ———— SAVE	The camera is turned ON but the VCR is put to the power-save mode in which the videoheads and cylinder are stopped. As the videosignal can be monitored on the viewfinder, this position can be used when adjusting the camera head. • This position can be used only with a VCR equipped with the power-save function.
 ON ON OFF OPERATE CAM VTR ST-BY SAVE SAVE	CAM (Camera) - ON VTR ———— STBY	The camera is turned ON and the VCR is put to the record-pause mode. Use this position when you are going to shoot immediately. • Some VCRs may not enter the record-pause mode.

3-4 ADJUSTMENTS BEFORE SHOOTING

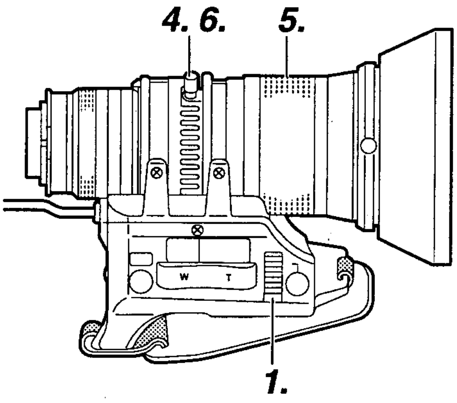
BACK FOCUS ADJUSTMENT OF A LENS

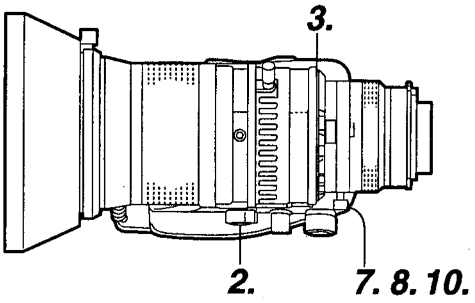


Object

It is only necessary to perform this when focusing is not correct in both the Telephoto and Wide-angle positions, such as when the lens is attached for the first time.
Adjust the viewfinder for sharpness first.

It is easier to adjust back focus when the subject is more than 3 meters from the camera.





1. Set the Iris mode SWITCH to M. (Manual)

2. Set the Zoom mode KNOB to M. (Manual)

3. Open the Iris ring.
Adjust the illumination to obtain an optimum video level.

4. Turn the zoom lever until the lens is completely in telephoto.

5. Focus on the subject.

6. Set the lens to completely Wide-Angle.

7. Loosen the back focus ring retaining knob.

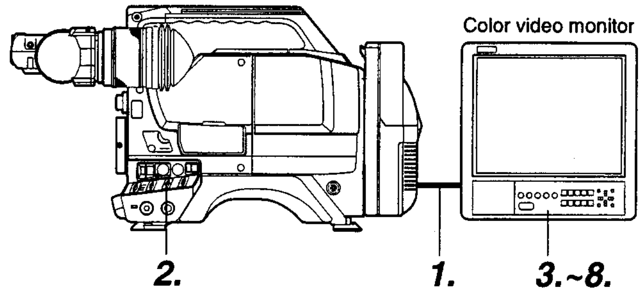
8. Adjust the back focus ring for the best possible focus.

9. Repeat steps ***4*** through ***8*** for fine adjustment.

10. Tighten the back focus ring retaining knob to secure the ring.

3-4 ADJUSTMENTS BEFORE SHOOTING (Cont'd)

EXTERNAL MONITOR ADJUSTMENT (For NTSC Model)



■ SMPTE color bars

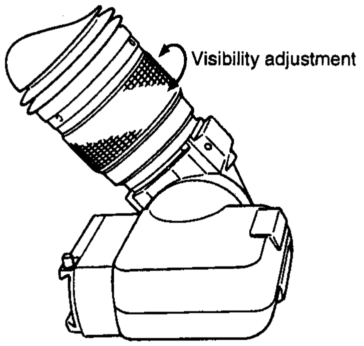
White ①	Yellow ②	Cyan ③	Green ④	Magenta ⑤	Red ⑥	Blue ⑦
Blue ⑧	Black ⑨	Magenta ⑩	Black ⑪	Cyan ⑫	Black ⑬	White ⑭
Black ⑮	White ⑯	Black ⑰	⑱	⑲	⑳	Black ㉑

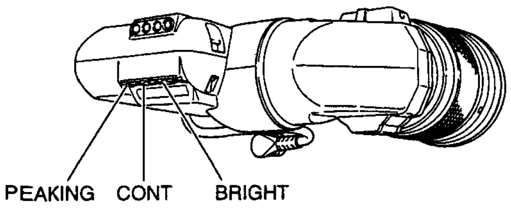
The color bar screen has a configuration as shown above.
The description hereinafter refers to the positions in the color bar screen using the numbers.

Display the color bar signal built in the camera head and adjust the colors, contrast and brightness.

1. Connect a color video monitor to the MONITOR OUTPUT connector of the camera head.
2. Set the MODE switch ⑫ to COLOR BARS to output the color bar signal (SMPTE color bars).
3. Set the monitor so that the screen turns entirely blue.
4. Adjust the chroma control of the monitor so that there is no difference in brightness between ① and ⑧ or between ⑦ and ⑭ of the color bars.
5. Adjust the phase control of the monitor so that there is no difference in brightness between ③ and ⑩ or between ⑤ and ⑫ of the color bars.
6. If the phase control adjustment above causes a difference in brightness between ① and ⑧ or ⑦ and ⑭, restart from the chroma control adjustment in step *4*.
7. Switch the monitor back to the standard screen (All of R, G, and B will appear).
8. Adjust the brightness by using the Brightness Adjusting control so that the color bar ⑱ and ⑲ disappears, and the color bar ⑳ becomes visible.

VIEWFINDER ADJUSTMENT





■ Visibility adjustment

Rotate the eyepiece focusing ring so that the viewfinder screen image is clearly visible.

■ Brightness and contrast adjustment

When the ambient brightness changes, the brightness and contrast of the viewfinder screen can be adjusted with the CONT and BRIGHT controls.

■ Peaking adjustment

Turning the PEAKING (contour adjustment) control makes the picture look sharper, making focus adjustment easier.

4. SHOOTING (BASIC OPERATIONS)

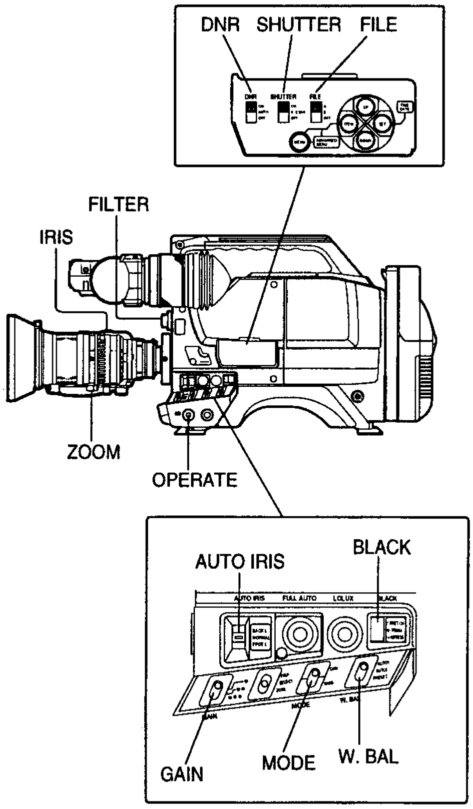
4-1 BASIC SHOOTING OPERATION

This section describes the procedure of image shooting using the automatic adjustment features of the camera. (For performing the setup without using the automatic adjustment features, refer to Section 5.)

The basic procedure is as follows:

① Ensure that the switches of the camera are in the standard positions.
② Make preparation for shooting.
③ Perform actual recording and playback.

SWITCH SETUP

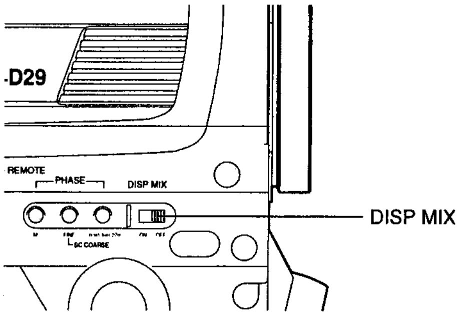


Switch	Standard Position	Details
AUTO IRIS	NORMAL	7 page, 37 page
BLACK	NORMAL	7 page, 37 page
GAIN	● position	6 page, 36 page
MODE	CAM	7 page
W.BAL	AUTO 1	7 page
DNR	OFF	8 page
SHUTTER	OFF	8 page, 17 page
FILE	OFF	8 page
ZOOM	S (Servo)	13 page
IRIS	A (Auto)	13 page
FILTER	Optimum position	See below.

■ FILTER (color temperature conversion filter)

Set the FILTER switch according to the object.

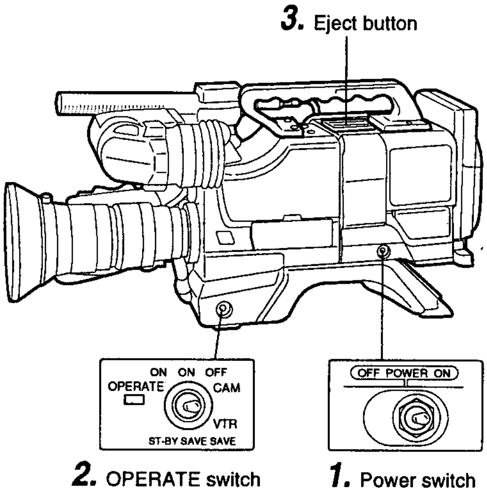
FILTER		Suitable Location
1	3200K	Indoors, dark outdoors
2	5600K	Outdoors
3	5600K + ND	Outdoors under fine weather
4	EFFECT	The cross effect filter makes the highlight sections shine like crosses and reduces the contrast. The corresponding color temperature is 3200K.

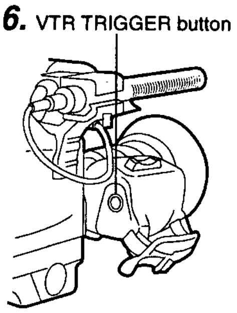


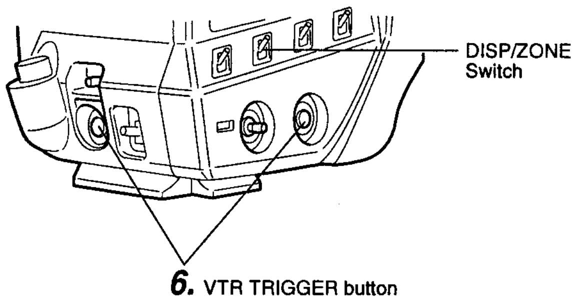
Switch	Standard Position	Details
DISP MIX	OFF	10 page

4-1 BASIC SHOOTING OPERATION (Cont'd)

RECORDING PROCEDURE


3. Eject button
ON ON OFF
OPERATE
CAM
VTR
ST-BY SAVE SAVE
OFF POWER ON
2. OPERATE switch
1. Power switch


6. VTR TRIGGER button


DISP/ZONE Switch
6. VTR TRIGGER button

1. Set the power switch of the VCR to ON.

2. Set the OPERATE switch of the camera head to VTR SAVE then, in a short while, to VTR ST-BY.
The VCR is turned ON and the OPERATE indicator lights up.

3. Open the cassette cover of the VCR by pressing its eject button, load a video cassette tape correctly and close the cassette cover gently.
When the cassette cover is closed, the tape is loaded and the VCR enters the record-pause mode.

CAUTION :

With the BR-S422, when the record-pause mode lasts for more than 30 minutes, the cylinder stops rotation to protect the tape and video heads and the OPERATE indicator of the VCR blinks.
To return to the record-pause mode, press the VTR trigger button of the camera head twice; the OPERATE indicator will stop blinking and remain lit.
When the VTR trigger button is pressed only once, the recording will begin in 8 to 10 seconds.

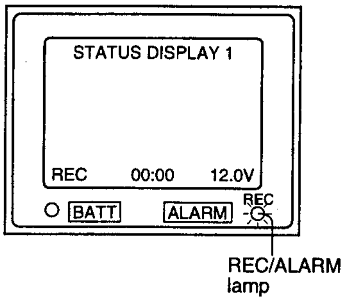
4. Check the setup of the switches.

5. Point the camera toward the object and adjust the focus and zoom.

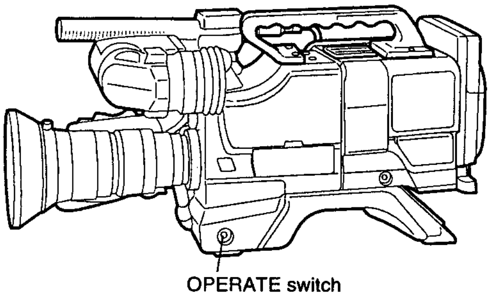
6. Start recording by pressing any of the following VTR trigger buttons.

- Camcorder-type operation : VTR trigger button of the zoom lens.
- Tripod operation : VTR trigger button of the camera head.
- Portable VCR system : VTR trigger button of the camera head.

Here, the REC/ALARM lamp on the viewfinder will light up. Also, pushing upward the DISPLAY/ZONE switch on the camera and selecting the Status Mode 1 will display "REC" in the viewfinder.


STATUS DISPLAY 1
REC
00:00
12.0V
BATT
ALARM
REC
REC/ALARM lamp

4-1 BASIC SHOOTING OPERATION (Cont'd)

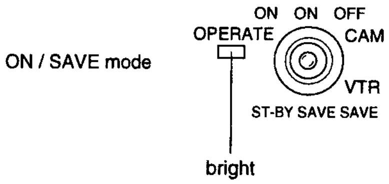


7. Press the VTR trigger button of the camera head again to put the VCR in the record-pause mode.
The REC/ALARM lamp then turns off and the status display message on the viewfinder screen changes to "ST-BY".

8. To end recording, set the OPERATE switch of the camera head to OFF/SAVE and the power switch of the VCR to OFF.

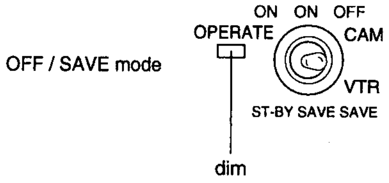
POWER-SAVE MODE

The battery power can be saved by turning the VCR from the record-pause mode to power-save mode.



- When the OPERATE switch of the camera head is set to ON/SAVE:
  The VCR enters the power-save mode while the camera power is ON. With this position, the image shot by the camera can be monitored on the viewfinder screen.
  When the VTR trigger button is pressed, the VCR will be changed from the SAVE mode to the ST-BY mode to start recording.

CAUTION :
It will take a short time because the recording starts from the stop condition of the head drum. Also a position between the recorded sections may be occupied.



- When the OPERATE switch of the camera head is set to OFF/SAVE:
  Both the camera and VCR enter the power-save mode. With this position, the image shot by the camera cannot be monitored on the viewfinder screen.

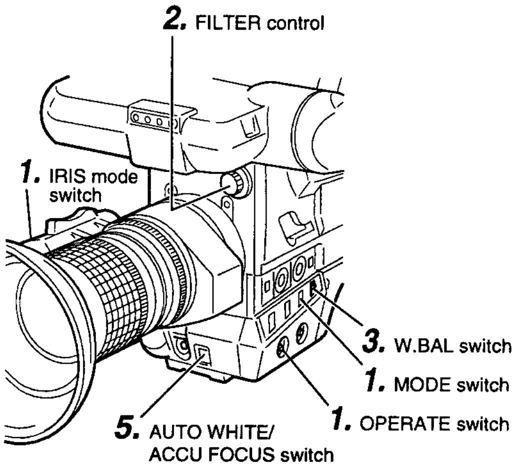
  In the SAVE mode of the VCR, the tape is left loaded around the heads.
  In the ST-BY mode of the VCR, the heads and cylinder are rotating.

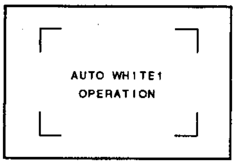
Note :
The VCR conditions corresponding to ON/SAVE and ON/ST-BY are variable depending on the VCR.

4-2 WHITE BALANCE ADJUSTMENT

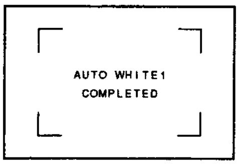
Since the color of light (color temperature) is variable depending on the light source, it is required to re-adjust the while balance when the main light source illuminating the object changes.

WHITE BALANCE ADJUSTMENT

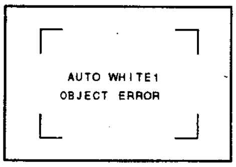



AUTO WHITE1
OPERATION

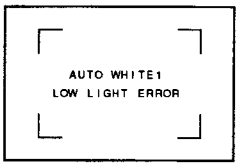
During operation


AUTO WHITE1
COMPLETED

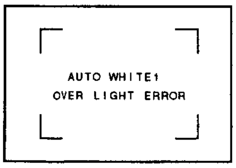
Result message


AUTO WHITE1
OBJECT ERROR

Object error


AUTO WHITE1
LOW LIGHT ERROR

Low light error


AUTO WHITE1
OVER LIGHT ERROR

Over-light error

Two kinds of white balance adjustment results can be stored in memories AUTO 1 and AUTO 2.

■ Adjustment procedure

1. Set the following switches.
- OPERATE switch of the camera head to ON/SAVE.
- MODE switch of the camera head to CAM (camera).
- IRIS mode switch of the lens to A (Auto).

2. Set the FILTER control according to the current lighting.

3. Set the W.BAL switch to AUTO 1 or AUTO 2.

4. Place a white object under the same lighting condition as the shooting object and zoom in to fill the screen with white.

5. Tilt the AUTO WHITE/ACCU FOCUS switch upward (to AUTO WHITE) once and release it.
- "OPERATION" is displayed on the viewfinder screen during the operation of the auto white balance adjustment circuit.
- "COMPLETED" is displayed when the white balance has been adjusted properly.

[Error messages]

- OBJECT ERROR
  Displayed when there is not enough white color on an object or the color temperature is not suitable.
- LOW LIGHT ERROR
  Displayed when the light is low. Increase the lighting illuminationthen re-adjust the white balance.
- OVER LIGHT ERROR
  Displayed when the light is excessively bright. Decrease the lighting illumination then re-adjust the white balance.

FULL-TIME AUTO WHITE BALANCE (FAW)

The FAW function adjusts the white balance value automatically as the lighting condition changes.

This mode is convenient when you have no time to adjust the white balance or when the camera is moved frequently in and out of places under different lighting conditions.

■ Setting procedure

The FAW function can be activated with item "FAW" on the Advanced Menu.

This item allows setting of the FAW function to one of the white balance switches, AUTO1, AUTO2 or PRESET. Select "NONE" if the FAW function is not required.

Reference: Page 42.

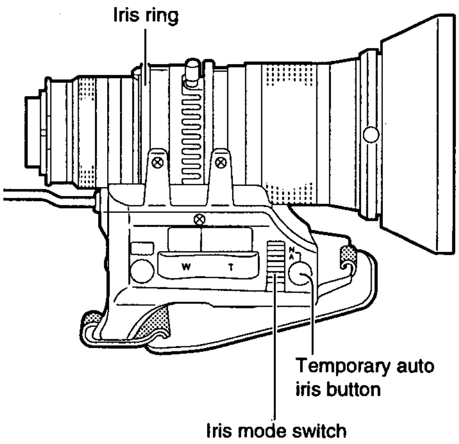
CAUTION :

The FAW(Full-time Auto White balance) function cannot provide optimum white balance with an object outside the FAW adjustment range, for example when it contains only a single color or not enough white color.

5. SHOOTING (APPLIED OPERATIONS)

5-1 IRIS (BRIGHTNESS) ADJUSTMENT

LENS IRIS ADJUSTMENT



The lens iris can be adjusted by any of the following three methods.

- Automatic adjustment
  Set the iris mode switch to "A (Auto)".
  The iris is adjusted automatically according to the brightness of the object.
- Manual adjustment
  Set the iris mode switch to "M (Manual)".
  The iris can be adjusted manually by rotating the iris ring.
- Temporary auto iris adjustment
  When this button is pressed during manual iris adjustment, the auto iris adjustment mode is activated only while this button is held depressed.

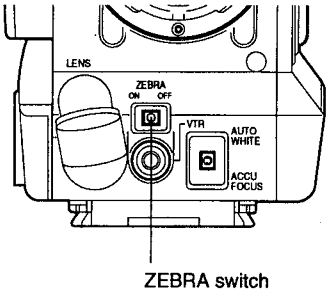
■ Changing the auto iris adjustment setup

Under special lighting conditions such as back-light condition, it is often suitable to change the value set by the auto iris adjustment.

This can be done by any of the following methods.

- Setting the AUTO IRIS LEVEL switch of the camera head (See page 37.)
- Setting item "IRIS" in the Main menu screen. (See page 39.)

ZEBRA PATTERN DISPLAY DURING MANUAL ADJUSTMENT



By setting the ZEBRA switch to ON, oblique stripes (zebra pattern) can be displayed in the sections with signal levels of 70% to 80% on the viewfinder screen.

The zebra pattern can be used as a reference for manual iris adjustment.

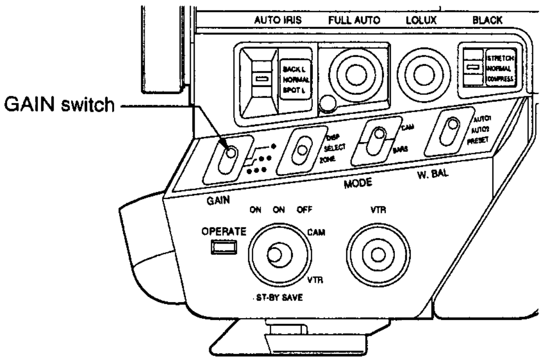
When adjusting the iris manually, adjust it so that the zebra patterns are displayed in the section which you want to stress in the object.

- The initial setting is 70 to 80%. However, with the "ZEBRA" setting on the ADVANCE MENU, zebra patterns can be displayed in the section of over 100% in brightness level. (See page 43)

5-2 GAIN (SENSITIVITY) ADJUSTMENT

The gain should be switched when the brightness is not enough due to the poor lighting condition.

GAIN SWITCHING


GAIN switch
AUTO IRIS
FULL AUTO
LOLUX
BLACK
BACK L
NORMAL
SPOT L
STRETCH
NORMAL
COMPRESS
DISP SELECT ZONE
CAM
BARS
AUTO1
AUTO2
PRESET
GAIN
MODE
W. BAL
ON ON OFF
VTR
OPERATE
CAM
VTR
ST-BY SAVE

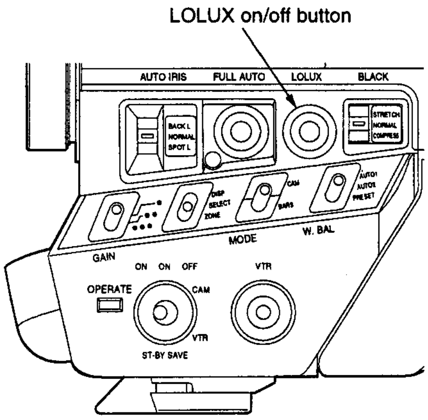
This switch allows the gain to be boostedwhen the illumination of the object is insufficient.

Switch Position	Factory-Set Gain
●	0 dB
●●	9 dB
●●●	18 dB

When this switch is switched, the newly set gain is displayed for a few seconds on the status 0 or mode 1 screen inside the viewfinder. Set it to ● (0 dB) in normal use.

- ■ The gain set with each of the switch positions can be set with "GAIN" of the ADVANCED MENU.
  Reference : See page 42 for details.
- ■ It is also possible to use the ALC which varies the gain automatically.
  Reference : See page 42 for details.
- ■ Smooth gain transition
  The gain transition can be made smoother using "SMOOTH TRANS" of the ADVANCED MENU.
  However, note that the SMOOTH TRANS function is not available if the switch is set to ALC.

GAIN BOOST UNDER LOLUX CONDITION

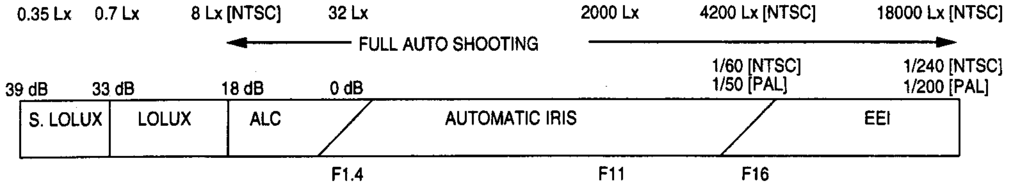

LOLUX on/off button
AUTO IRIS
FULL AUTO
LOLUX
BLACK
BACK L
NORMAL
SPOT L
STRETCH
NORMAL
COMPRESS
DISP SELECT ZONE
CAM
BARS
AUTO1
AUTO2
PRESET
GAIN
MODE
W. BAL
ON ON OFF
VTR
OPERATE
CAM
VTR
ST-BY SAVE

The LOLUX on/off button is designed to be used when an illumination insufficient cannot be compensated for with the GAIN switch alone. Press the button to enter the LOLUX mode in which the gain is boosted by about 33 dB.
"LOLUX ON" is displayed for a few seconds on the status 0 or 1 mode screen inside the viewfinder.
Pressing the button again cancels the LOLUX mode.
"LOLUX OFF" is displayed for a few seconds.

- ■ Switching to SUPER LOLUX boost
  The LOLUX boost value can be changed to the SUPER LOLUX value by using the ADVANCED MENU.
  The gain boost of SUPER LOLUX is about 39 dB. However, when the SUPER LOLUX function is on, the after-image will increase.
  - Shutter speed cannot be changed while the SUPER LOLUX mode is ON.

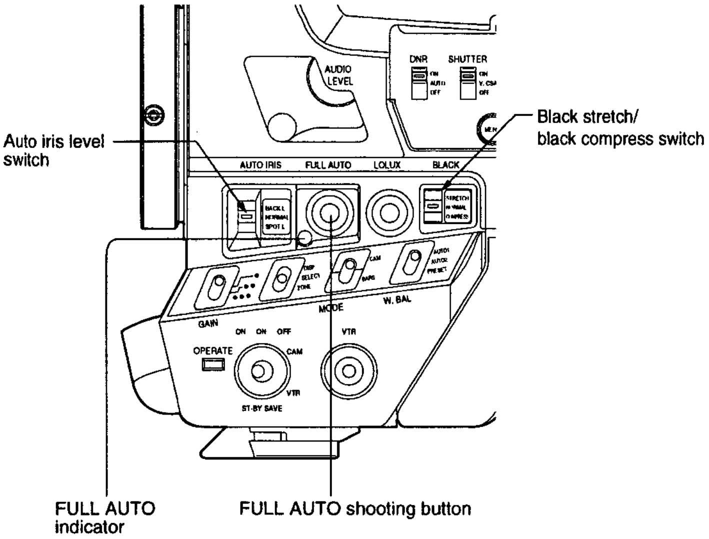
  Reference: Page 42.
- ■ Even in the SMOOTH TRAINS mode, the switching between LOLUX and SUPER LOLUX is not achieved smoothly.
- ■ When the LOLUX or SUPER LOLUX is in use, the image definition on the screen will degrade to increase residual images, but it is not an indication of afailure.

[Relationship between gain, iris and shutter]


0.35 Lx
0.7 Lx
8 Lx [NTSC]
32 Lx
2000 Lx
4200 Lx [NTSC]
18000 Lx [NTSC]
FULL AUTO SHOOTING
1/60 [NTSC]
1/50 [PAL]
1/240 [NTSC]
1/200 [PAL]
39 dB
33 dB
18 dB
0 dB
S. LOLUX
LOLUX
ALC
AUTOMATIC IRIS
EEI
F1.4
F11
F16

5-3 SWITCH SETUP ACCORDING TO ILLUMINATION AND OBJECT

SWITCH FUNCTIONS



AUTO IRIS LEVEL switch

This switch allows changing of the reference value for the auto iris adjustment according to the lighting condition.

BACK. L	: When the object is in the back-light condition. Sets the Auto Iris reference value to a value which is about 1 step wider than the standard setting.
NORMAL	: Normal lighting condition.
SPOT. L	: When the object is under a spotlight. Sets the Auto Iris reference value to a value which is about 1 step narrower than the standard setting.

BLACK stretch/black compress switch

On the black screen, this switch makes the image easier to see by varying the black gain.

BLACK STRETCH	: Boosts the black gain to improve the reproducibility of black color.
NORMAL	: Normal black gain.
BLACK COMPRESS	: Attenuates the black gain to make the image sharper.

FULL AUTO SHOOTING (FAS) FUNCTION

The FAS function provides a wide range of compatibility with shooting conditions which varies as you move between indoors and outdoors or between bright and dark locations. It is not necessary to change the switch and filter positions every time you move.
The FAS function provides an integrated control of the ALC (Automatic Level Control), Auto iris and FAW (Full-time Auto White balance) functions.

■ Operation

1. Simply press the FULL AUTO button to enter the FAS mode, in which the FULL AUTO indicator lights and "FAS" is displayed on the right of the viewfinder screen.

2. Pressing the FULL AUTO button again cancels the FAS mode and turns the FULL AUTO indicator off.

■ Automatic setting contents

- If you have been displaying the color bars, the screen is switched automatically to the camera image.
- The auto iris adjustment mode is entered even if the iris mode switch of the lens is set to Manual.
- The GAIN switch and W.BAL switch settings are defeated in the FAS mode.
- The LOLUX button setting is active even in the FAS mode. However, the ALC and EEI are defeated in the LOLUX mode, in which only the auto iris adjustment and FAW are used.
- All of the previous setting contents are recalled when the FAS mode is canceled.
- The SMOOTH TRANS function is defeated during switching by the FAS function.

5-4 MENU SCREENS

FLOW OF MENU SCREENS

The menu screen appears in the viewfinder. It also appears in the MONITOR OUTPUT when the DISP MIX switch㊱ is set to "ON".
The camera incorporates two series of menu screens, the [MAIN MENU] menus and [ADVANCED MENU].

■ [MAIN MENU]

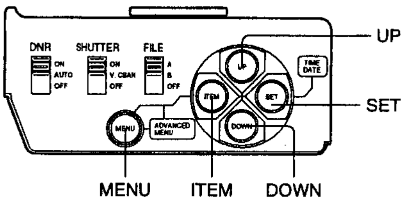
- [ACCM REC TIME RESET] Resets the ACCUmulated recording time of the tape.
- [MENU] Includes convenient functions for use in recording, for example the detail enhancement function.
- [CLOCK SET] sets the date and time and changes their displays.

■ [ADVANCED MENU]

- [OPERATION] Used to change the factory-set values for the zebra pattern display, gain, etc.
- [PROCESS] Used to fine-adjust the gamma characteristic, etc. of the camera input signal.
- [SCENE FILE] Used to register the set values.

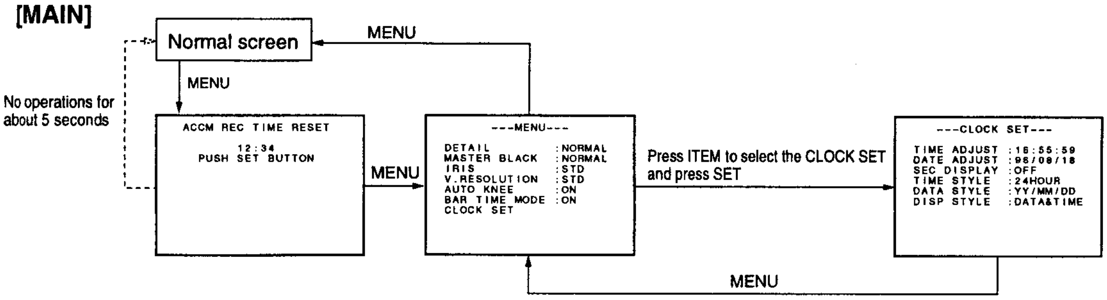
Note :

If you use the MONITOR OUTPUT as the backup signal output, set the DISP MIX switch to OFF so that characters are not output to the recorder.



Operation Button	Function
MENU	Press to display a menu screen, etc.
ITEM	Press to move the cursor or an item on the menu screen.
UP/DOWN	Press to select the setting values on the menu screen.
SET (TIME DATE)	Press to enter the set value in memory.

[MAIN]



No operations for about 5 seconds

Press ITEM to select the CLOCK SET and press SET

```
ACCM REC TIME RESET

       12:34
  PUSH SET BUTTON
```

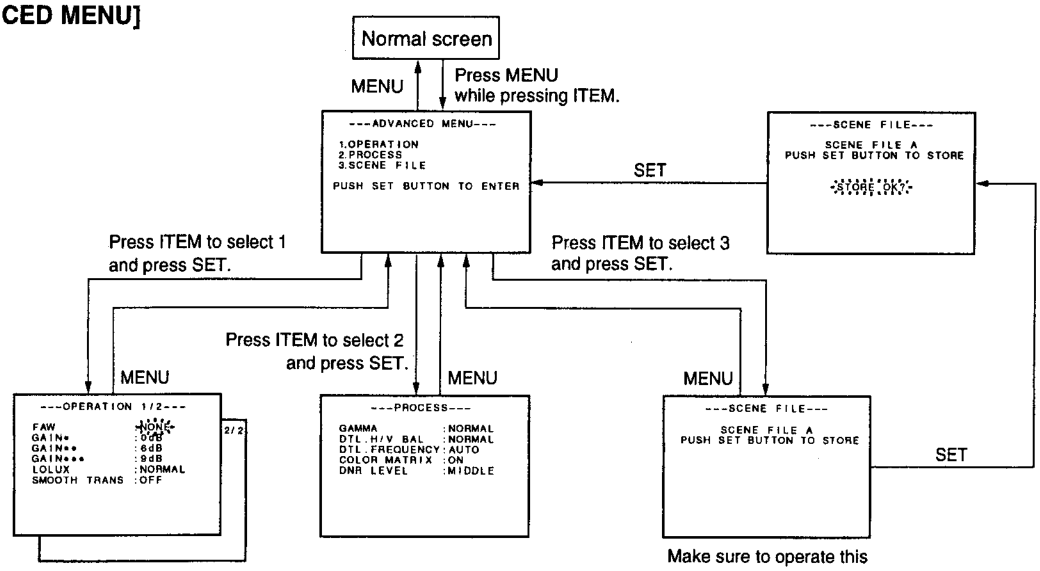
```
---MENU---

DETAIL          :NORMAL
MASTER BLACK    :NORMAL
IRIS            :STD
V.RESOLUTION    :STD
AUTO KNEE       :ON
BAR TIME MODE   :ON
CLOCK SET
```

```
---CLOCK SET---

TIME ADJUST  :16:55:59
DATE ADJUST  :96/08/18
SEC DISPLAY  :OFF
TIME STYLE   :24HOUR
DATA STYLE   :YY/MM/DD
DISP STYLE   :DATA&TIME
```

[ADVANCED MENU]



Press MENU while pressing ITEM.

Press ITEM to select 1 and press SET.

Press ITEM to select 2 and press SET.

Press ITEM to select 3 and press SET.

```
---ADVANCED MENU---

1.OPERATION
2.PROCESS
3.SCENE FILE

PUSH SET BUTTON TO ENTER
```

```
---SCENE FILE---

SCENE FILE A
PUSH SET BUTTON TO STORE

STORE OK?
```

```
---OPERATION 1/2---

FAW           :NONE
GAIN•         :0dB
GAIN••        :6dB
GAIN•••       :9dB
LOLUX         :NORMAL
SMOOTH TRANS  :OFF
```

2/2

```
---PROCESS---

GAMMA          :NORMAL
DTL.H/V BAL    :NORMAL
DTL.FREQUENCY  :AUTO
COLOR MATRIX   :ON
DNR LEVEL      :MIDDLE
```

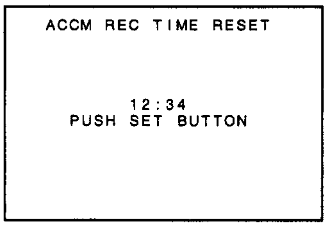
```
---SCENE FILE---

SCENE FILE A
PUSH SET BUTTON TO STORE
```

Make sure to operate this for data registration.

5-4 MENU SCREENS (Cont'd)

RESETTING THE ACCUMULATED RECORDING TIME (ACCM REC TIME RESET)



ACCM REC TIME RESET

12:34
PUSH SET BUTTON

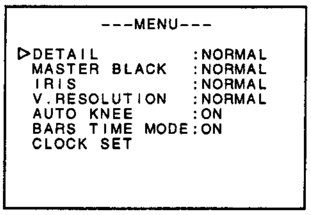
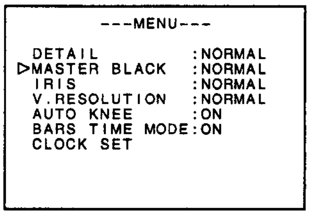
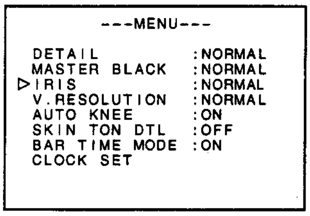
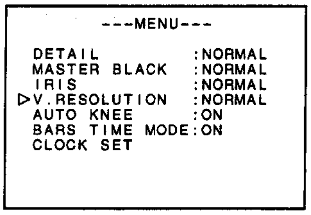
<Setting procedure>

1. From the normal screen, press the MENU button to display the "ACCM REC TIME RESET" screen on the viewfinder. If the DISP MIX switch ㊱ is ON, it will be displayed on the MONITOR OUTPUT.
2. Press the SET button; the ACCUmulated recording time is reset to "00:00" and the normal screen returns.
   Even if the SE button is not pressed, the normal screen is displayed again in about 5 seconds.

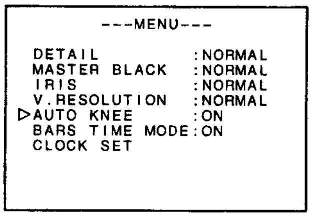
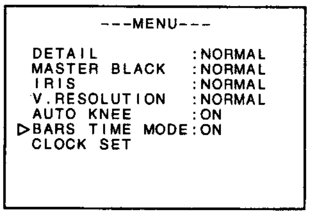
SETTING THE MAIN MENU SCREEN

<Setting procedure>

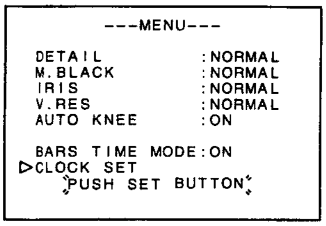
1. Press the MENU button twice while the normal screen is displayed (or press the MENU button once while "ACCM REC TIME RESET" screen is displayed) to display the "MENU" screen on the viewfinder. If the DISP MIX switch ㊱ is ON, it will be displayed on the MONITOR OUTPUT.
2. Press the ITEM button to move the cursor (▷) downward till the item to be set is reached.
3. Press the UP/DOWN button to select the desired value.
4. Press the MENU button to enter the set values and return to the normal screen.

Item	Displayed Screen	Function, Operation	Variation Range	Initial Setting
DETAIL	 ---MENU--- ▷DETAIL :NORMAL MASTER BLACK :NORMAL IRIS :NORMAL V.RESOLUTION :NORMAL AUTO KNEE :ON BARS TIME MODE:ON CLOCK SET	Adjusts the detail enhancement level. ● To sharpen details .... Increase the number (UP). ● To soften details .... Decrease the number (DOWN).	MAX 6 15 step to NORMAL to –6 MIN	NORMAL
M.BLACK	 ---MENU--- DETAIL :NORMAL ▷MASTER BLACK :NORMAL IRIS :NORMAL V.RESOLUTION :NORMAL AUTO KNEE :ON BARS TIME MODE:ON CLOCK SET	Adjusts the pedestal level (master black) which is the reference of black. ● To increase the pedestal level ..... Increase the number (UP). ● To decrease the pedestal level .... Decrease the number (DOWN).	MAX 9 21 step to NORMAL (0) to –9 MIN (–10)	NORMAL
IRIS	 ---MENU--- DETAIL :NORMAL MASTER BLACK :NORMAL ▷IRIS :NORMAL V.RESOLUTION :NORMAL AUTO KNEE :ON SKIN TON DTL :OFF BAR TIME MODE :ON CLOCK SET	Changes the setting value of the detecting level in the auto iris mode. ● PEAK......... Detects the peak level of brightness ● NORMAL ... Detects normal level ● AVG .... Detects the average level of brightness	PEAK NORMAL AVG	NORMAL
V.RES	 ---MENU--- DETAIL :NORMAL MASTER BLACK :NORMAL IRIS :NORMAL ▷V.RESOLUTION :NORMAL AUTO KNEE :ON BARS TIME MODE:ON CLOCK SET	Increases the vertical resolution. ● NORMAL ... Vertical resolution 380 lines. ● V.PLUS ...... Vertical resolution 420 lines. Residual images may increase. ● V.MAX........ Vertical resolution 450 lines. The sensitivity is degraded and the bright section may be coloured depending on the objects.	NORMAL V. PLUS V. MAX	NORMAL

5-4 MENU SCREENS (Cont'd)

Item	Displayed Screen	Function, Operation	Variation Range	Initial Setting
AUTO KNEE	 ---MENU--- DETAIL :NORMAL MASTER BLACK :NORMAL IRIS :NORMAL V.RESOLUTION :NORMAL ▷AUTO KNEE :ON BARS TIME MODE:ON CLOCK SET	Selects whether the auto knee point is varied depending on the input signal. ● ON ..... Varied depending on the input signal ● OFF ... Not varied depending on the input signal	ON OFF	ON
BARS TIME MODE	 ---MENU--- DETAIL :NORMAL MASTER BLACK :NORMAL IRIS :NORMAL V.RESOLUTION :NORMAL AUTO KNEE :ON ▷BARS TIME MODE:ON CLOCK SET	Sets whether the time is displayed together with color bars. ● ON ..... Displays the time with color bars. During the color bar mode on the ordinary screen, the date/time display can not be changed with the SET (TIME/DATE) button. ● OFF ... Does not display the time with color bars. During the color bar mode on the ordinary screen, the date/time display can be changed with the SET (TIME/DATE) button as for the setting in the camera mode.	ON OFF	ON

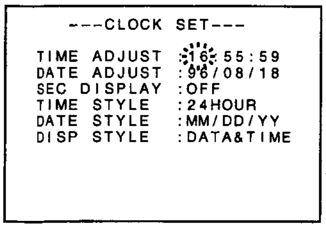
SETTING THE DATE AND TIME



```
      ---MENU---
DETAIL          :NORMAL
M.BLACK         :NORMAL
IRIS            :NORMAL
V.RES           :NORMAL
AUTO KNEE       :ON

BARS TIME MODE:ON
▷CLOCK SET
   PUSH SET BUTTON
```

MENU screen



```
    ---CLOCK SET---
TIME ADJUST   :16:55:59
DATE ADJUST   :96/08/18
SEC DISPLAY   :OFF
TIME STYLE    :24HOUR
DATE STYLE    :MM/DD/YY
DISP STYLE    :DATA&TIME
```

CLOCK SET screen

The date and time display can be changed with the timer function built into this unit.

<How to set>

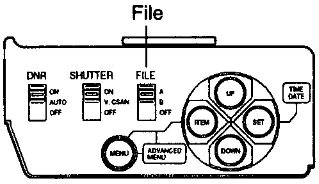
1. Press the MENU button twice at the normal screen (or press the MENU button once at the ACCM REC TIME RESET screen) and the MENU screen will be displayed on the viewfinder screen.
2. Press the ITEM button to move a cursor (▷) to the CLOCK SET. "PUSH SET BUTTON" starts blinking.
3. When the SET button is pressed, the CLOCK SET screen will be displayed and the time section of the TIME ADJUST starts blinking.
4. Press the ITEM button to move the blinking light to the item to be changed. (Each time the ITEM button is pressed, the blinking light moves as following order. hour→minute→month→day→year→SEC. DISPLAY→TIME STYLE→DATE STYLE→DISP STYLE)
5. The value of each item can be changed with the UP and DOWN button.
6. Repeat the procedure ***4*** to ***5*** for all required items.
7. Press the MENU button twice to go back to the normal screen.

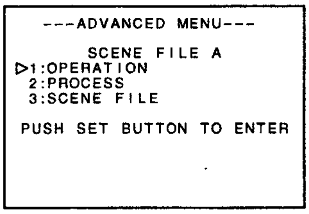
■ The setting and correction of the following items can be done at the CLOCK SET screen.

- TIME ADJUST (To change times)
  Correction of hours, minutes and seconds.
- DATE ADJUST (To change the dates)
  Correction of year, month and date.
- SEC DISPLAY (To change seconds)
  ON : Display seconds
  OFF : Not display seconds
- TIME STYLE (To change the time display mode)
  24 HOUR : 24-hours display (ex. 16:55:59)
  12 HOUR : 12-hour display (ex. 4:55:59 PM)
- DATE STYLE (To change date display)
  YY/MM/DD : Year/Month/Day
  DD/MM/YY : Day/Month/Year
  MM/DD/YY : Month/Day/Year
- DISP STYLE (Select the contents to be displayed.)
  DATE & TIME: Displays date and time.
  DATE: Displays date only.
  TIME: Displays time only.

5-4 MENU SCREENS (Cont'd)

SETTING THE ADVANCED MENU SCREEN



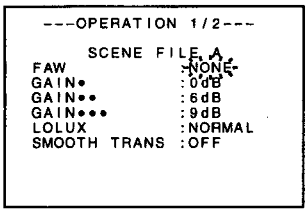


```
---ADVANCED MENU---

SCENE FILE A
▷1:OPERATION
 2:PROCESS
 3:SCENE FILE

PUSH SET BUTTON TO ENTER
```

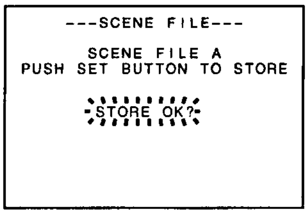
ADVANCED MENU screen



```
---OPERATION 1/2---

     SCENE FILE A
FAW           :NONE
GAIN•         :0dB
GAIN••        :6dB
GAIN•••       :9dB
LOLUX         :NORMAL
SMOOTH TRANS  :OFF
```

Selection screen
(Example with OPERATION 1/2)

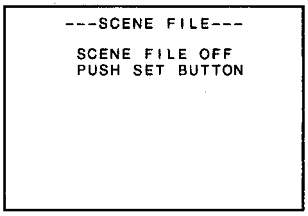


```
---SCENE FILE---

SCENE FILE A
PUSH SET BUTTON TO STORE

STORE OK?
```

SCENE FILE screen
(Example with FILE A)



```
---SCENE FILE---

SCENE FILE OFF
PUSH SET BUTTON
```

SCENE FILE screen
(Example with FILE OFF)

<Setting procedure>

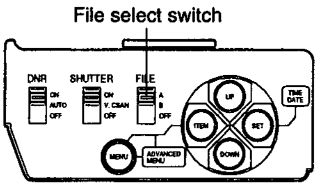
1. Set the FILE switch ⑬ to the desired FILE A or FILE B. The registered set value will be maintained in the memory after switching the power off.
2. From the normal screen, press the MENU button while pressing the ITEM button. The "ADVANCED MENU" screen is displayed in the viewfinder.
3. Select "1. OPERATION" or "2. PROCESS" with the ITEM button.
4. Press the SET button to display the selected screen.
5. Select the desired item with the ITEM button. (The selected item blinks.)
6. Select the setting value of each item with the UP or DOWN button.
7. After setting, press the MENU button to display the "ADVANCED MENU" screen.
8. Select 3.SCENE FILE with the ITEM button and press the SET button.
   To abandon the registration at the SCENE FILE screen, press the MENU button to return to the ADVANCED MENU screen. The altered set value will not be registered at this stage, however, it is valid till the power is off.
9. After selecting the FILE, press the SET button twice to enter the set values in the memory and return to the "ADVANCED MENU" screen.
   Pressing the SET button once will display a message "STORE OK?". When you press the button again, the settings made will be registered to FILE.

CAUTION :

- If the FILE switch is set to OFF, the registration will not be carried out even if the SET button is pressed. Press the SET button to return to the ADVANCED MENU screen.
- The values set while the FILE switch is in the OFF position are not registered but remain valid until the power is switched OFF.

10. Press the MENU button at the advanced menu screen to return to the normal screen.

EXECUTING THE OPERATION/PROCESS MENU FILES



The OPERATION menu items and the PROCESS menu items are stored in FILE A or FILE B. To shoot image using the conditions which have been entered in a file, select the file using the File switch.

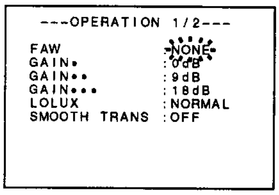
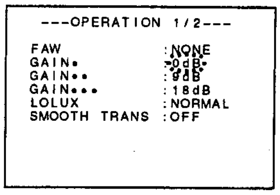
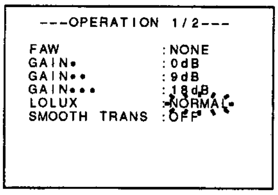
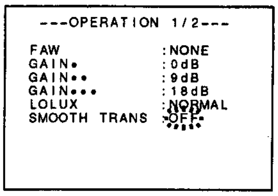
FILE A : Shooting with the conditions stored in FILE A.
FILE B : Shooting with the conditions stored in FILE B.
OFF : Shooting with the factory-set conditions.

5-4 MENU SCREENS (Cont'd)

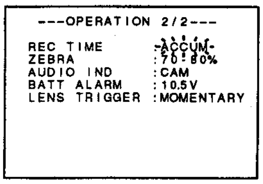
OPERATION (1/2) SCREEN

This screen allows changing of the set values of the built-in functions of the camera including the GAIN, LOLUX and ZEBRA pattern functions.

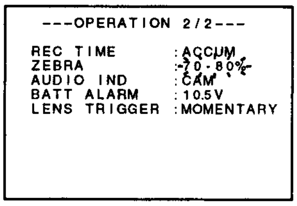
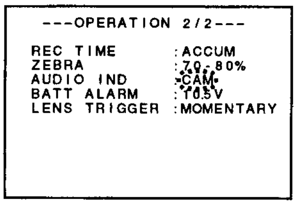
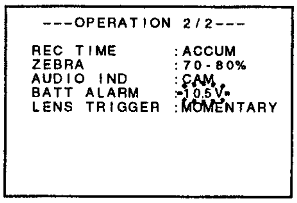
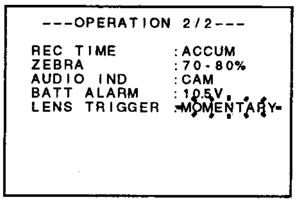
1. Each time the ITEM button is pressed, a blink on the set items moves downwards one by one.
2. To switch from the OPERATION (1/2) to (2/2), press the ITEM button at "SMOOTH TRANS".
3. To switch from the OPERATION (2/2) to (1/2), press the ITEM button at "LENS TRIGGER".
4. Press the UP/DOWN button in order to change the settings.
5. When the settings are completed, press the MENU button to return to the ADVANCED MENU screen.
6. Use the ITEM button to select "3 SCENE FILE", and press the SET button to registor the set value in the FILE A or FILE B.

Item	Displayed Screen	Function, Operation	Variation Range	Initial Setting
FAW	 ---OPERATION 1/2--- FAW :NONE GAIN• :0dB GAIN•• :9dB GAIN••• :18dB LOLUX :NORMAL SMOOTH TRANS :OFF	Selects the position of the W.BAL switch ⑪ where the FAW (Full-time Auto White balance adjustment) function is to be assigned. NONE ..... FAW function is not used. AUTO 1 .. FAW is assigned to the AUTO 1 position. AUTO 2 .. FAW is assigned to the AUTO 2 position. PRESET .. FAW is assigned to the PRESET position.	NONE AUTO1 AUTO2 PRESET See page 34 for the FAW function.	NONE
GAIN • GAIN •• GAIN •••	 ---OPERATION 1/2--- FAW :NONE GAIN• :0dB GAIN•• :9dB GAIN••• :18dB LOLUX :NORMAL SMOOTH TRANS :OFF	Assigns gain values to each position of the GAIN switch ⑧. GAIN • .... Assigns a gain value for the GAIN • position. GAIN •• ..... Assigns a gain value for the GAIN •• position. GAIN ••• ... Assigns a gain value for the GAIN ••• position. –3 dB, 0 dB, 6 dB, 9 dB, 12 dB, 18 dB, ALC (Auto gain Level Control)	–3dB 0dB 6dB 9dB 12dB 18dB *The resolution may be degraded when it is set to 18 dB. ALC (Auto gain level control) See page 36 for the ALC function.	GAIN•0dB GAIN••9dB GAIN•••18dB
LOLUX	 ---OPERATION 1/2--- FAW :NONE GAIN• :0dB GAIN•• :9dB GAIN••• :18dB LOLUX :NORMAL SMOOTH TRANS :OFF	Sets the LOLUX values to be activated with the LOLUX button ⑨. NORMAL.... Normal LOLUX value (33 dB gain boost). SUPER....... Super LOLUX value (39 dB gain boost).	NORMAL SUPER	NORMAL
SMOOTH TRANS	 ---OPERATION 1/2--- FAW :NONE GAIN• :0dB GAIN•• :9dB GAIN••• :18dB LOLUX :NORMAL SMOOTH TRANS :OFF	Smoothens the transition when the GAIN switch ④, or W.BAL switch ⑪ is switched over and achieves gradual change in place of sudden change. ON ..... Activates the smooth transition function. OFF ... Deactivates the smooth transition function. The SMOOTH TRANS function is defeated during switching of the LoLux and FAS buttons as well as during switching of the GAIN switch which is assigned to ALC.	ON OFF	OFF

OPERATION (2/2) SCREEN

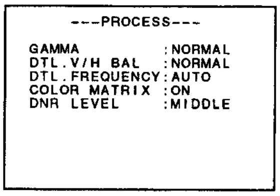
Item	Displayed Screen	Function, Operation	Variation Range	Initial Setting
REC TIME	 ---OPERATION 2/2--- REC TIME :ACCUM ZEBRA :70-80% AUDIO IND :CAM BATT ALARM :10.5V LENS TRIGGER :MOMENTARY	Sets either the remaining tape recording time or the accumulated recording time to be displayed on the viewfinder screen. ACCM........ accumulated recording time display REMAIN .... Remaining time display	ACCUM REMAIN	ACCUM

5-4 MENU SCREENS (Cont'd)

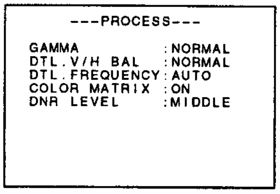
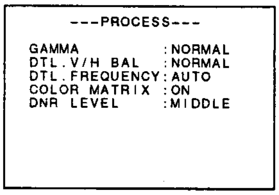
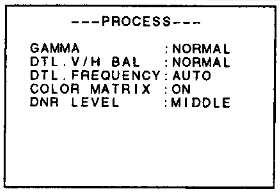
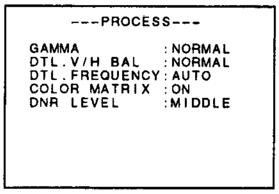
Item	Displayed Screen	Function, Operation	Variation Range	Initial Setting
ZEBRA	 ---OPERATION 2/2--- REC TIME :ACCUM ZEBRA :70-80% AUDIO IND :CAM BATT ALARM :10.5V LENS TRIGGER :MOMENTARY	Switches the brightness level of the object section where the zebra pattern is displayed. 70-80% .... Zebra pattern is displayed in sections with brightness levels between 70% and 80%. OVER 100% ... Zebra pattern is displayed in sections with brightness levels over 100%.	70%–80%, OVER100%	70–80%
AUDIO IND	 ---OPERATION 2/2--- REC TIME :ACCUM ZEBRA :70-80% AUDIO IND :CAM BATT ALARM :10.5V LENS TRIGGER :MOMENTARY	It changes audio indicator source to be displayed in the viewfinder. CAM : Displays the volume level of the MIC connected to a camera. VTR : Displays the volume level of the sound returned from the VCR.	CAM VTR	CAM
BATT ALARM	 ---OPERATION 2/2--- REC TIME :ACCUM ZEBRA :70-80% AUDIO IND :CAM BATT ALARM :10.5V LENS TRIGGER :MOMENTARY	Sets the voltage at which the battery alarm starts to be displayed on the viewfinder screen.	10.5 to 13.5 V 7 stages in 0.5 V steps	10.5V
LENS TRIGGER	 ---OPERATION 2/2--- REC TIME :ACCUM ZEBRA :70-80% AUDIO IND :CAM BATT ALARM :10.5V LENS TRIGGER :MOMENTARY	Changes the lens trigger setting according to the lens in use. MOMENTARY ..... Compatible with momentary (non-lock type) triggering. Mainly used with lenses using the 12-pin connector. ALTERNATE .... Compatible with alternate (lock type) triggering. Mainly used with lenses using the 8-pin connector.	MOMENTARY ALTERNATE	MOMENTARY

PROCESS SCREEN

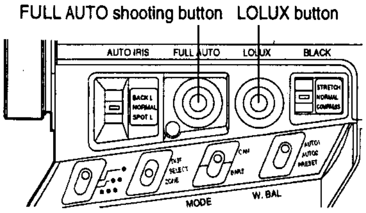
1. The set values can be changed with the UP or DOWN button.
2. After setting,, press the MENU button to return to the ADVANCED MENU screen.
3. Use the ITEM button to select "3 SCENE FILE", and press the SET button to register the set value in the FILE A or FILE B.

Item	Displayed Screen	Function, Operation	Variation Range	Initial Setting
GAMMA	 ---PROCESS--- GAMMA :NORMAL DTL.V/H BAL :NORMAL DTL.FREQUENCY:AUTO COLOR MATRIX :ON DNR LEVEL :MIDDLE	Correction of the gamma curve to decide the replay ability of black color. • To enhance the black color replayed However, halftones will be lost for white section .... Increase the number (UP) • To attenuate the black color replayed .... Decrease the number (DOWN)	MAX (8) 7 15 step to +OFF NORMAL (0) to –5 MIN (–6) OFF	NORMAL

5-4 MENU SCREEN (Cont'd)

Item	Displayed Screen	Function, Operation	Variation Range	Initial Setting
DTL. V/H BAL	 ---PROCESS--- GAMMA : NORMAL DTL.V/H BAL : NORMAL DTL.FREQUENCY : AUTO COLOR MATRIX : ON DNR LEVEL : MIDDLE	Sets the direction, horizontal (H) or vertical (V), in which stronger detail enhancement is applied. ● To strengthen the H enhancement .... Increase the number (UP). ● To strengthen the V enhancement .... Decrease the number (DOWN).	V-MAX (4) 3 to 8 step NORMAL (0) to –2 V-HIN (–3)	NORMAL
DTL. FREQUENCY	 ---PROCESS--- GAMMA : NORMAL DTL.V/H BAL : NORMAL DTL.FREQUENCY : AUTO COLOR MATRIX : ON DNR LEVEL : MIDDLE	Varies the detail enhancement level by changing the detail enhancement frequency. ● AUTO.... Auto-set through zoom. ● HIGH..... Applies strong detail enhancement. Used to shoot subjects with fine patterns. ● MIDDLE ... Applies medium detail enhancement. ● LOW ..... Applies weak detail enhancement. Used to shoot subjects with large patterns.	AUTO HIGH MIDDLE LOW	AUTO
COLOR MATRIX	 ---PROCESS--- GAMMA : NORMAL DTL.V/H BAL : NORMAL DTL.FREQUENCY : AUTO COLOR MATRIX : ON DNR LEVEL : MIDDLE	Sets the color matrix5 ● OFF .... Deactivates the color matrix function ● ON ...... The color replayed is enhanced, but noise increases.	ON OFF	ON
DNR LEVEL	 ---PROCESS--- GAMMA : NORMAL DTL.V/H BAL : NORMAL DTL.FREQUENCY : AUTO COLOR MATRIX : ON DNR LEVEL : MIDDLE	Sets the DNR (Digital Noise Reduction) effect level ● HIGH..... Streng thens the DNR effect, however the after-image will increase ● MIDDLE ... Midium level ● HIGH..... Weakens the DNR effect. (Useful when shooting a quickly moving object.)	HIGH MIDDLE LOW	MIDDLE

RESETTING THE FILE



The data registered in FILE A or FILE B is returned to the initial values.

To return FILE A to its initial value:
Power up the camera while holding down the FULL AUTO shooting button.

To return FILE B to its initial value:
Power up the camera while holding down the LOLUX button.

SYSTEM RESET

The System Reset allows the resetting of the functions and levels set on the MENU screen to the initial values, as well as the functions listed below.

<Setting procedure>
While holding the SET button of the camera head depressed, set the OPERATE switch to turn the power ON.

<Items which are reset>

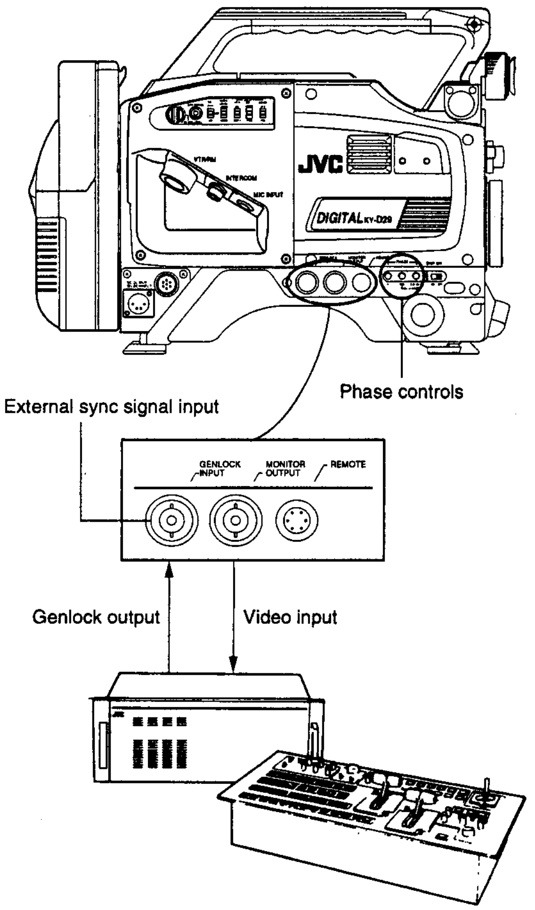
- MAIN MENU screen
  Reference Page 39: "Initial Values of MAIN MENU Screen"
- CLOCK SET screen
  - TIME ADJUST, DATE ADJUST: The time and date data which has been set is not reset.
  - SEC DISPLAY : OFF.
  - TIME STYLE : 24HOUR.
  - DATE STYLE : MM/DD/YY (Month/Day/Year)
  - DISPLAY STYLE : DATE & TIME (Both date/time displayed)
- ADVANCED MENU screen
  The data of both FILE A and FILE B is reset to the initial values.
  Reference Pages 42-44: "Initial Values of ADVANCED MENU Screen"
- Other initial values

Function	Initial Value
SHUTTER	1/100 (NTSC),1/120 (PAL)
DISP STATUS	Status 0
Safety zone	Mode 0 (OFF)
LoLux	OFF
FAS	OFF
V.SCAN	1/100.2 (NTSC), 1/120.1 (PAL)
Date/time	OFF (Not displayed)

- The memories related to the switches which are set in the mechanical positions and the Auto White Balance memory are not reset.

6. SYSTEM UPGRADING

6-1 CONNECTION WITH A SWITCHER


JVC
DIGITAL KY-D29
VTR/RM
INTERCOM
MIC INPUT
External sync signal input
Phase controls
GENLOCK INPUT
MONITOR OUTPUT
REMOTE
Genlock output
Video input

Genlocking is a function which synchronizes the video output signal of the camera with another component including a camera and switcher. The phases of the camera signal can be adjusted relatively with reference to the black burst or composite video signal. The camera is genlocked through the sync signal input connector ㉛ or the remote control unit.

• Phase adjustment

Two phase controls are provided for use in adjusting the horizontal and the color phases.

H : Horizontal sync phase control for use in adjusting the H phase so that the reference signal and the video output signals are coincident in terms of position and time on the screen.

SC COARSE : A rough adjustment of the sub carrier (SC) can be made while observing a vector scope. (0°,90°, 180°, 270°)

SC FINE : A fine adjustment can be made. If sufficient adjustment cannot be made, switch the SC COARSE and try the SC FINE adjustment again.

- The adjustments require the use of external measuring instruments such as a waveform monitor, oscilloscope and vector scope.
  As the signal phase is unstable for a moment after the power of each piece of equipment is turned on, wait a while before starting the phase adjustment.

CAUTION :

The camera cannot be genlocked with a VCR playback signal because this may cause a sync error or color phase variation. However, this is not a malfunction but due to the timebase variation in the VCR playback signal that corresponds to the wow and flutter of the audio tape playback signal. If you should use the VCR playback signal as the reference signal, be sure to correct the signal using a timebase corrector or similar equipment.

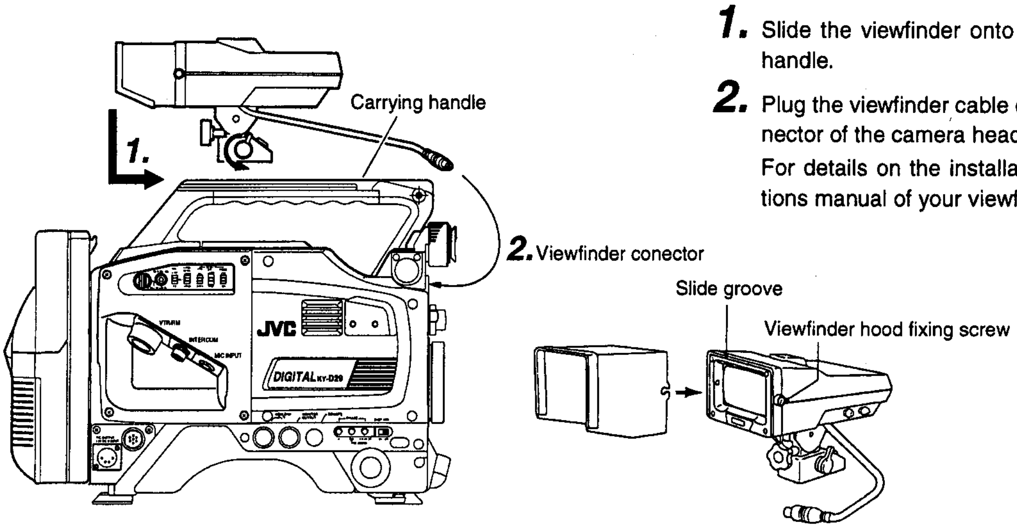
6-2 CONNECTION WITH THE STUDIO-USE VIEWFINDER (VF-P400)

A studio viewfinder can be installed on the carrying handle.

1. Slide the viewfinder onto the slide bracket of the carrying handle.

2. Plug the viewfinder cable connector into the viewfinder connector of the camera head.

For details on the installation method, refer to the instructions manual of your viewfinder.

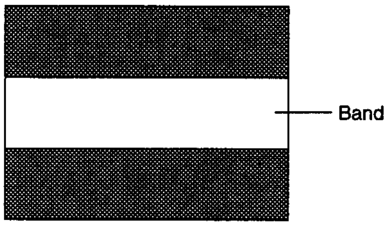

Carrying handle
1.
2. Viewfinder conector
JVC
DIGITAL KY-D29
Slide groove
Viewfinder hood fixing screw

CAUTION :

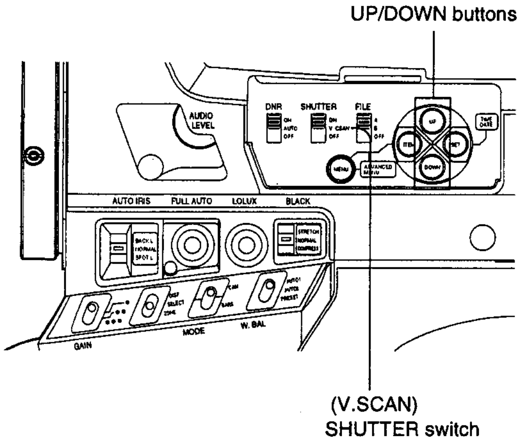
Perform the necessary connections by setting the camera power switch to OFF. Connection with the power switch ON may lead to a malfunction of the camera.

In this case, set the power switch to OFF, and after waiting for more than 5 seconds, set it back to ON.

6-3 SHOOTING THE SCREEN IMAGE ON THE COMPUTER MONITOR



Video monitor



● Outline

- The following operation allows the alignment of the shutter speed of the camera with the variable scanning rate of the computer monitor or display.
- When a computer monitor or display is shot with the camera, a bright horizontal line indicating excessive exposure is displayed in cases when the scanning rate of the monitor is faster than the shutter speed of the camera or a dark horizontal line indicating insufficient exposure is displayed in cases when the monitor's scanning rate is slower than the camera's shutter speed.
- The scanning frequency of the monitor is variable due to various reasons during the computer operation. Adjust the scanning rate so as to obtain a stable image while observing the image on the viewfinder screen.

■ Variable scan [V.SCAN]

● Basic operation

Set the SHUTTER switch to the center position (V.SCAN) then adjust the shutter speed with the UP or DOWN button. (The speed is displayed on the viewfinder screen.)

● Compatible frequencies

The variable scan function is compatible with the scanning frequencies in the following range.
60.5 to 1966.7 Hz (NTSC)
50.4 to 1953.1 Hz (PAL)

CAUTION :

- Compatibility with a computer monitor with a low scanning rate, cannot be obtained.

- If the SHUTTER switch has already been set to ON or V.SCAN, press the UP or DOWN button to display the shutter speed, then press the same button again to change the displayed speed.

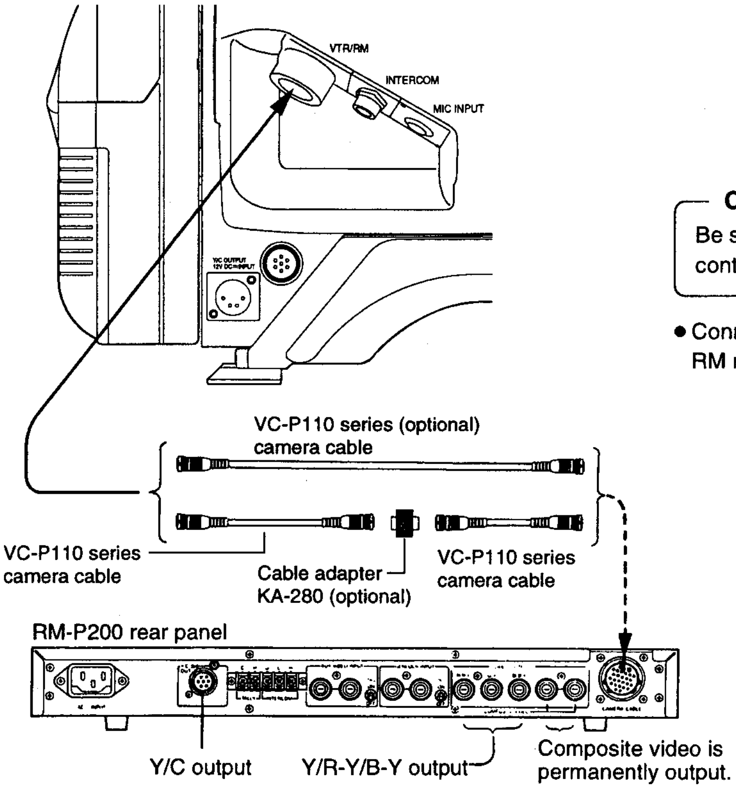
6-4 CONNECTION WITH THE REMOTE CONTROL UNIT (RM-P200/-P300)

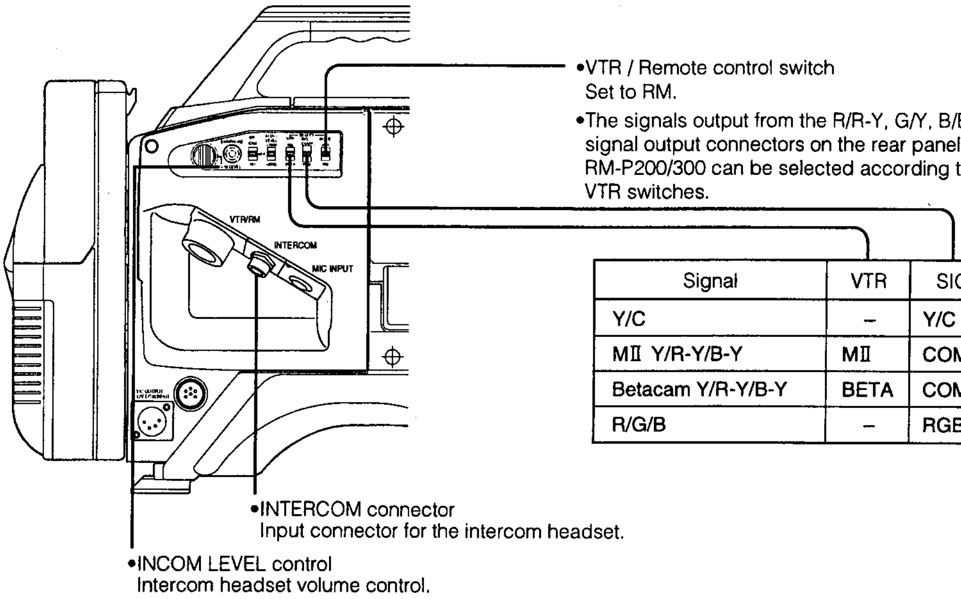
The camera can be remote-controlled by connecting it to the RM-P200/-P300 remote control unit (optional). Be sure to read the instruction manual of your remote control unit before proceeding with the connection.

CONNECTION METHOD

CAUTION :
Be sure to set the power switches of the camera and remote control before proceeding with the connection.

- Connect an optional VC-P110 series camera cable to the VTR/RM multi- input connector of the camera adapter.


VTR/RM
INTERCOM
MIC INPUT
Y/C OUTPUT
12V DC INPUT
VC-P110 series (optional) camera cable
VC-P110 series camera cable
Cable adapter KA-280 (optional)
VC-P110 series camera cable
RM-P200 rear panel
Y/C output
Y/R-Y/B-Y output
Composite video is permanently output.


VTR/RM
INTERCOM
MIC INPUT

•VTR / Remote control switch
Set to RM.

•The signals output from the R/R-Y, G/Y, B/B-Y and Y/C signal output connectors on the rear panel of the RM-P200/300 can be selected according to the SIG and VTR switches.

Signal	VTR	SIG
Y/C	–	Y/C
MII Y/R-Y/B-Y	MII	COMP
Betacam Y/R-Y/B-Y	BETA	COMP
R/G/B	–	RGB

•INTERCOM connector
Input connector for the intercom headset.

•INCOM LEVEL control
Intercom headset volume control.

Refer to the section 1.12 "CONNECTION WITH REMOTE CONTROL UNIT, RM-P200/RM-P300" on page 1-10.

6-4 CONNECTION WITH THE REMOTE CONTROL UNIT (RM-P200/-P300) (Cont'd)

RM-P200

The RM-P200 is a versatile camera control unit that combines many features needed for studio or remote Stand-Alone operation.
Control and power is supplied for the camera to a distance of 100 Meters (325 feet) using the optional VC-P110 series camera cables. Cable Signal Level compensation is finely adjustable. Intercom connection and Tally trigger/indication are provided.

- **Camera control includes:**

Shutter speed
Camera/Bars output
Gain
Automatic White Balance
Manual White Balance with Red Gain and Blue Gain
Black Balance/Auto Set (Auto white only)
Master Black level
Iris, Manual and Auto

Genlock functions, Loop through Reference video connection as well as SC phase and H phase adjustment are all possible from the remote unit with controls located on the front panel. Two composite video outputs are provided, as well as a choice of either RGB, Component or Y/C output. These basic functions are controlled completely by the serial data connection to and from the camera. Other advanced functions such as LOLUX or Full Auto Shooting, Full Time Auto White, Variable Scan, shutter speed in 1/100 (NTSC),1/120 (PAL),1/2000 and others are not controlled.

RM-P300

CAUTION :
When the RM-P300 is connected, the camera or the RM-P300 should be adjusted internally depend on it's configuration.
In this case, please consult JVC authorized service center.

In addition to all the basic functions of the RM-P200, the RM-P300 adds comprehensive front panel warnings.

- **Additional advanced functions:**

Manual Black balance (Paint)
(with Red Gain and Blue Gain)
Black paint
Contour control
Function Lock
Call tally function
4 wire intercom

IN CASE OF DIFFICULTY

- **Troubles related to video image**

Abnormal color phase:
- Is the SC phase adjusted properly?

No locking with the reference signal:
- Is the MODE switch of the KA-27 camera adapter set to RM?
- Is the reference signal input through the GENLOCK INPUT connector?
- Is a VCR playback signal not used as the reference signal?
- Is the reference signal a proper signal such as composite video or black burst?
  * Genlocking does not occur with a computer output signal.

- **Troubles related to control**

Tally lamp does not light:
- Is power supplied to the tally input connector?
- Is the internal trigger switch set properly?

Intercom is not possible:
- Does the headset in use have an optimum impedance (between 200 and 600 ohms)?
- Is the MODE switch of the KA-27 camera adapter set to RM?

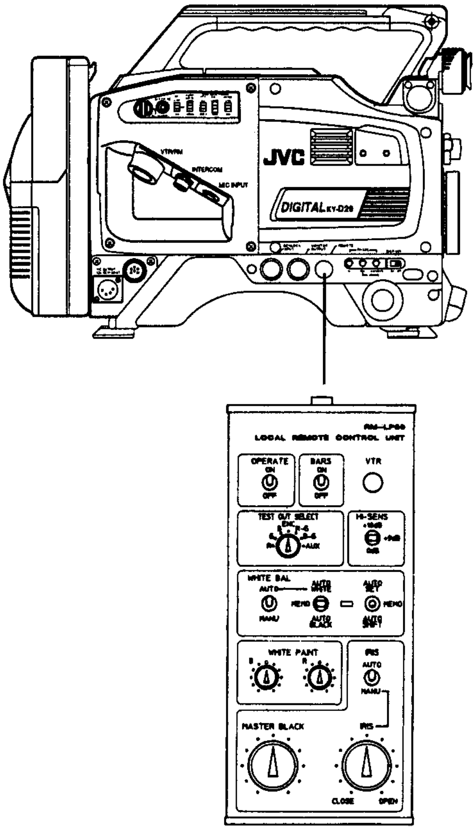
Auto setup indicator does not light:
- Are all of the cables connected properly?

CAUTION :
While the gain, shutter or white balance adjustment function is operated from the remote control unit, the FAS function cannot be used even when it is activated on the camera.

CAUTION :
The functions which are available on the camera but not on the remote control unit cannot be controlled. However, setting the gain control to 24 dB on the RM-P300 puts the camera in the LoLux mode (+33 dB).

Refer to the section 1.11 "CONNECTION WITH RM-P270, TRIAXIAL UNIT" on page 1-9.

6-5 CONNECTION WITH THE LOCAL REMOTE CONTROL UNIT (RM-LP80/-LP35/-LP37)


JVC
DIGITAL KY-D29
RM-LP80
LOCAL REMOTE CONTROL UNIT
OPERATE
BARS
VTR
TEST OUT SELECT
HI-SENS
WHITE BAL
AUTO WHITE
AUTO SET
AUTO BLACK
AUTO SHIFT
WHITE PAINT
IRIS
MASTER BLACK
CLOSE
OPEN

RM-LP80

■Connection method

Connect the cable from the RM-LP80/-LP35/-LP37 to the local remote control connector of the camera.

■Operation procedure

The lens iris mode is automatically returned to the auto mode.

1. Set the Operate switch of the RM-LP80/-LP35/-LP37 to ON to enable the local remote control operation.

■Functions which cannot be remote controlled

The following functions are found on the remote control unit but not provided on the camera. Therefore, any operation related to these functions performed on the local remote control unit becomes invalid.

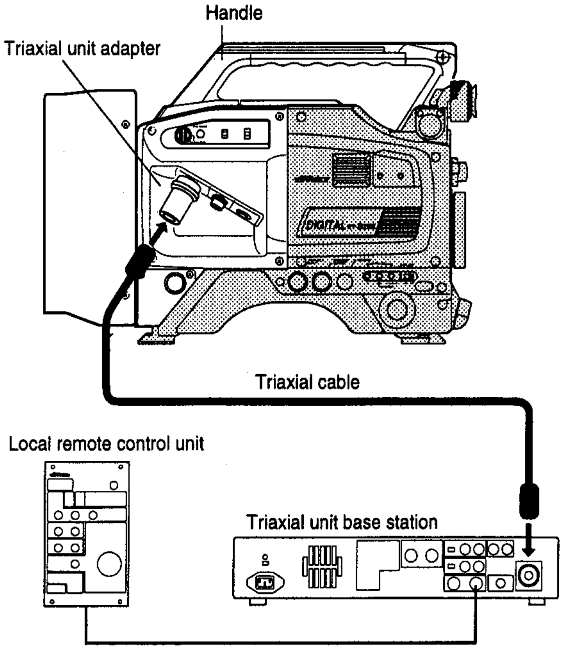
RM-LP80 : TEST OUT SELECT switch
AUTO SHIFT function
Knee point function
Auto black function
Auto set function (except Auto white)
RM-LP35 : Knee point, Auto black function
RM-LP37 : Auto black function

Notes :

- When the same switch function is provided on both the local remote control unit and camera, the function on the remote control unit is given priority and it cannot be operated from the camera.
- The gain value follows the value set on the local remote control regardless of the setting made on the camera.
- While the local remote control unit is active, the LoLux and FAS functions of the camera cannot be used.

For details, read the instruction manual of your local remote control unit.

6-6 CONNECTION WITH THE TRIAXIAL UNIT (RM-P270)


Handle
Triaxial unit adapter
Triaxial cable
Local remote control unit
Triaxial unit base station

The use of RM-P270 will allow the 14.5mm-diameter cable to be extended up to 1.5 kilometers.

■ Connection

1. Attach the adapter and the handle to the camera.
2. Connect the adapter and the base station via a triaxial cable (separately available).
3. Attach the local remote control unit (RM-LP37, RM-LP35) if necessary.

CAUTION :

When any of the functions unavailable from the camera, such as AUTO BLACK, are operated from the local remote control unit, other operations may be disabled. For models whose numbers in the last four columns of the RM-P270 serial numbers are smaller than 0087, upgrading of the software is provided on charge. Contact the local JVC authorized service center.

CAUTION :

For more information on the connection, operation, and restrictions on the operation, refer to the operation manual for the attachments.

6-7 CONNECTION WITH OTHER ACCESSORIES

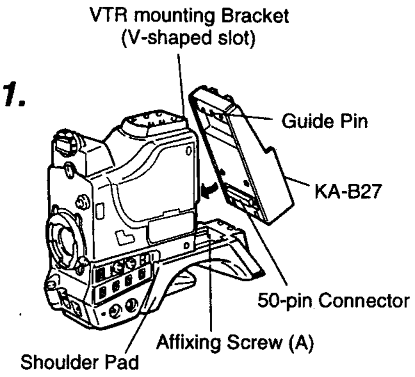
■ Connection with the BVV-5 Betacam SP VCR

The KA-B27 VCR adapter is required for connecting the BVV-5 to the camera.

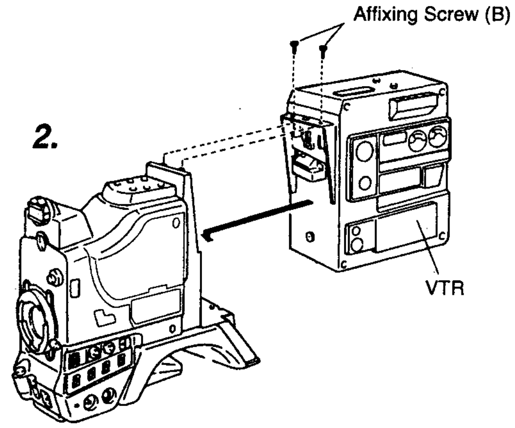
- **Connection of the KA-B27**

  Use the handle supplied with the BVV-5. It is not necessary to remove the VCR mounting bracket to allow connection.

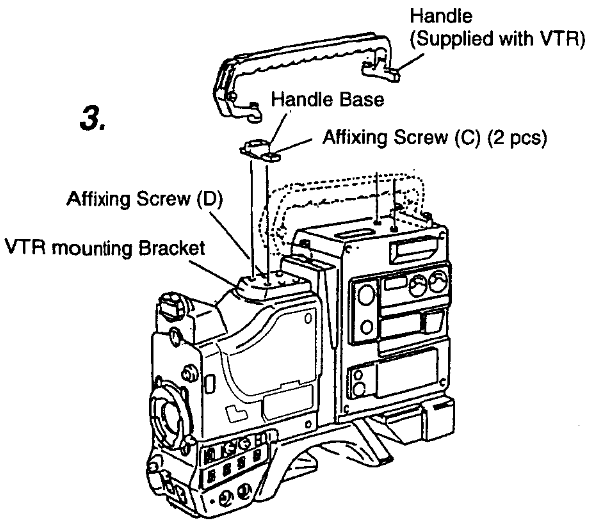
1.


VTR mounting Bracket
(V-shaped slot)
Guide Pin
KA-B27
50-pin Connector
Affixing Screw (A)
Shoulder Pad

2.


Affixing Screw (B)
VTR

3.


Handle
(Supplied with VTR)
Handle Base
Affixing Screw (C) (2 pcs)
Affixing Screw (D)
VTR mounting Bracket

1. Align the guide pin of the KA-B27 with the V-shaped slot on the rear of the camera section. Insert the guide pin in the slot while pressing the KA-B27's 50-pin connector to the corresponding connector on the rear of the camera section to dock them with each other.

   Tighten an affixing screw (A) under the shoulder pad as shown below.

2. If the VCR is equipped with a handle, remove the handle before attaching the adapter.

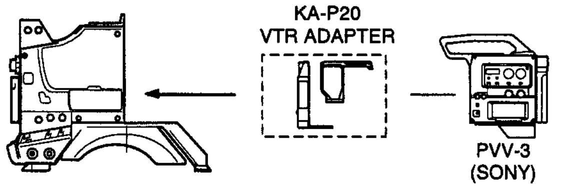
   Slide the VCR onto the rear of the adapter to dock them with each other, and secure them with two affixing screw (B) provided with the VCR as shown below.

3. Attach the provided handle base to the top of the camera with two affixing screws (C).

   Fit the camcorder with the handle that was removed from the VCR in the above step 2 as shown below.

   To fit the VCR mounting bracket to the camera again, push it in the direction of the front side while fixing it with two affixing screws (D).

6-6 CONNECTION WITH OTHER ACCESSORIES (Cont'd)



■ Connection with a professional Betacam VCR

(This requires the use of the optional KA-P20 VCR adapter.)
The KA-P20 VCR adapter should be used to connect the camera with a professional Betacam VCR. ThisVCR adapter contains a handle as its part.

For information on the settings of the switch, see the KA-P20 Operation Manual.

■ Installation with the Chest rest KA-111

See the KA-111 Instruction Manual.

7. OTHERS

7-1 IN CASE OF DIFFICULTY

■ Errors related to the white balance, auto setup and black balance functions

■ Error messages displayed on the viewfinder screen

AUTO WHITE 1, 2 OBJECT ERROR :

- Check if the white section of the object used in the white balance adjustment during shooting is white enough.
- Check if the selected filter matches the lighting condition.

AUTO WHITE 1,2 LOW LIGHT ERROR :

- Check the iris adjustment and if the lighting should be increased.

AUTO WHITE 1,2 OVER LIGHT ERROR :

- Check the iris adjustment and if the lighting is optimum.

■ Other :

The Full-time Auto White balance function cannot adjust the white balance.

- The white balance cannot be obtained if the screen image contains only a single color in the FAW mode.

■ VCR error

• Error message displayed on the viewfinder screen

VCR OP MISS? :

- This message is output when you use a JVC S-VHS VCR in the camcorder type configuration and press the trigger button while the VCR is not in the record-pause mode.
  Press the record and play buttons of the VCR to enter the record-pause mode.
- The message is output when the trigger (start) button of the camera/VCR is pressed while the stop button of the VCR has been pressed.
- Also check if the connections are correct.

■ Other troubles related to the VCR

Recording is not possible :

- Check if the erasure protection tab of the videocassette is broken.
- Check if the Operate switch of the VCR is set to the power-save mode. In this case, when the VCR is turned ON, the record-pause mode is released and it automatically enters the stop mode.
  As it is not possible to restart the VCR while the operate switch of the camera is set to ON/ST-BY, put the VCR in the record-pause mode.
- If the VCR will not start, also check the lens trigger mode setting.

Power supply troubles :

- When the cassette is not ejected shortly after the power is turned on, the current capacity of the power supply may be insufficient.
- When the power is turned off in less than 1 second after the cassette holder opens, the cassette holder door may not be able to close tightly.

Poor VCR image :

- The image in the still or search mode may fluctuate up and down, be interfered with by noise or turn black and white. These phenomena are not malfunctions.
- The VCR may not be able to record or play tapes under severe vibrations.
- The audio cannot be reproduced in the search mode.

Accumulated recording time/remaining tape time:

- The displayed time is approximate information. Certain errors may be produced depending on the time the VCR enters the record mode.

■ Dark or dim image on the viewfinder screen

- Adjust the CONT and BRIGHT controls of the viewfinder.
- Ensure that the color temperature conversion filter control knob is set to a position other than "5600K+ND".
- Ensure that the iris is not closed.
- Ensure that the shutter speed is not set too fast.
- Check the connection of the viewfinder cable.

7-2 SPECIFICATIONS

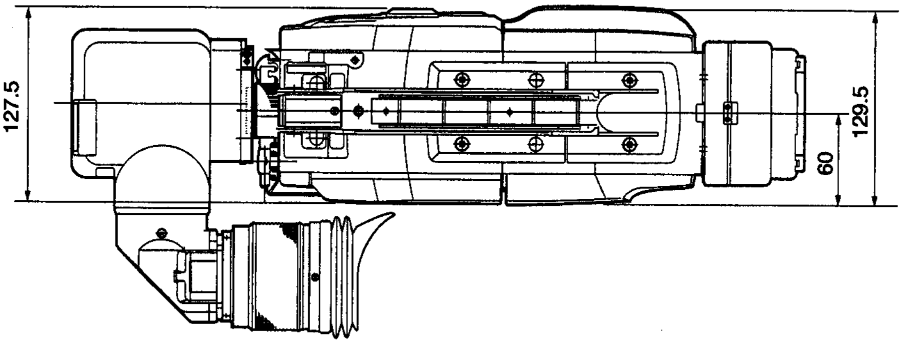
- Design and specifications are subject to change without notice.

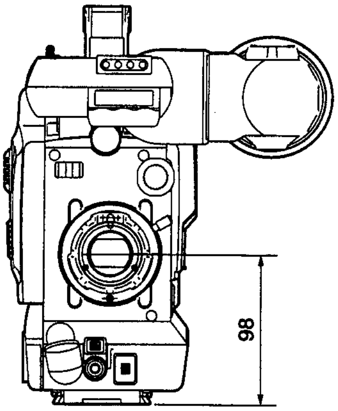
Image pickup system : R, G, B 3-CCD
Image pickup devices : Inter-line CCDs
Image size : 2/3 inch
Effective pixels : 768 (H) × 493 (V) [for NTSC]
: 754 (H) × 581 (V) [for PAL]
Color separation optics : 3-block prism optical system, F/1.4
Lens mount : 2/3 inch, bayonet
Synchronization : Internal sync (built-in SSG), External sync (VBS or BB)
Color format : NTSC (broadband R-Y/B-Y encoder)
: PAL (broadband R-Y/B-Y encoder)
Sensitivity : F/11, 2000 lux
Minimum object illumination : 0.35 lx (F/1.4, Super LoLux)
S/N : 62 dB (typical) 65 dB (when DNR is set to ON) [for NTSC]
: 60 dB (typical) 63 dB (when DNR is set to ON) [for PAL]
Horizontal resolution : 850 lines (center), Y signal
Gain boost circuit : Basic modes: 0 dB/+9 dB/+18 dB (–3, 6, 12 dB, ALC can be selected)
Registration : 0.05% (entire screen area, lens characteristics ignored)
Detail correction : Two-way in both H and V directions
Auto knee function : Built in
White balance : Preset (3200K), Auto white (AW1, AW2), Full-time auto white
Color bar signal : SMPTE type color bars [for NTSC]
: EBU FULL FIELD [for PAL]
Electronic shutter : 1/100 (NTSC), 1/120 (PAL), 1/250. 1/500, 1/1000, 1/2000, EEI (Electronic Iris)
Variable scan : 60.5 Hz to 1966.7 Hz [for NTSC]
: 50.4 Hz to 1953.1 Hz [for PAL]
Color temperature conversion filter : ① 3200K, ② 5600K, ③ 5600K+1/16ND, ④ 3200K+effect (cross) filter

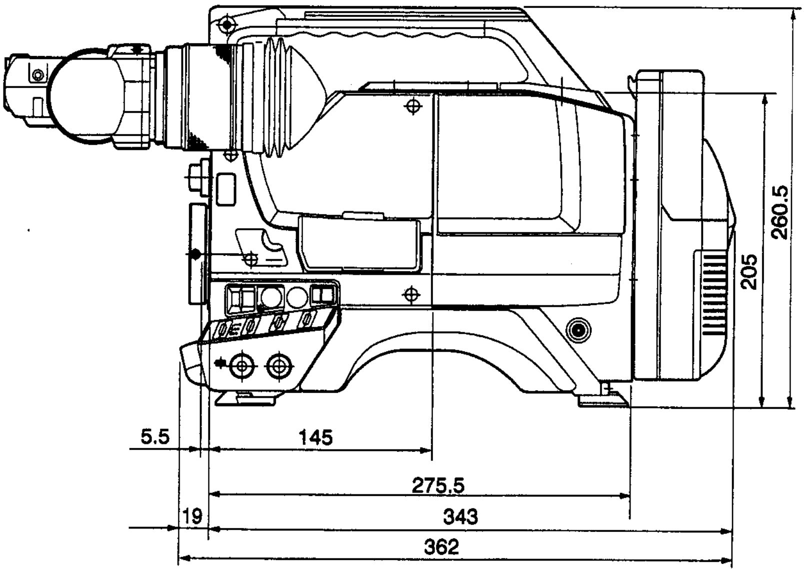
Video outputs (KA-27) : ① Composite video 1 V(p-p), 75-ohm
: ② Y/C 358
Y : 1 V(p-p), 75-ohm (with SYNC)
C : 0.286 V(p-p), 75-ohm (burst) [for NTSC]
: 0.3 V(p-p), 75-ohm (burst) [for PAL]
③ Component
R : 0.7 V(p-p), 75-ohm
G : 0.7 V(p-p), 75-ohm
B : 0.7 V(p-p), 75-ohm
Y : 1 V(p-p), 75-ohm
R-Y : 0.486 or 0.7 V(p-p), 75-ohm [for NTSC]
: 0.525 V(p-p), 75-ohm [for PAL]
B-Y : 0.486 or 0.7 V(p-p), 75-ohm [for NTSC]
: 0.525 V(p-p), 75-ohm [for PAL]
Audio output : –20 dBm/-60 dBm switchable
Audio monitoring : Fold-back from VCR (8-ohm)
Fold-back video input : 1 V(p-p), 75-ohm
Genlock signal input : Composite video 1 V(p-p), 75-ohm or ; black burst 0.43 V(p-p), 75-ohm [for NTSC] 0.45 V(p-p), 75-ohm [for PAL]
Microphone inputs : –60 dBm balanced (camera, 3-pin XLR), –60 dBm balanced (KA-27, 3-pin XLR)
Power supply : 12 V DC (10.5 to 15 V)
Current consumption (standard operation) : 16 W (camera head only, w/o camera adapter, viewfinder and lens)
19 W (with camera, camera adapter, viewfinder and lens)
Operating temperatures : –5 to +45°C
Weight : 4.3 kg (including VF-P116 and KA-27 but w/o lens)
Accessories : Microphone holder 1
Tripod base 1
Provided documents : Instructions 1
Warranty card 1

7. GENERAL

■ Dimensions [Unit : mm]


127.5
129.5
60




260.5
205
5.5
145
275.5
19
343
362

The outer dimensions as shown in the diagram are for the camera head attached with the camera adapter (KA-27) and viewfinder (VF-P116).

Design and specifications are subject to change without notice.

KY-D29 COLOR VIDEO CAMERA

JVC

VICTOR COMPANY OF JAPAN, LIMITED

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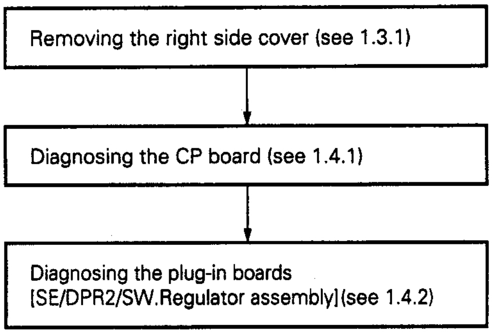
Printed in Japan
SC96757

SECTION 1
SERVICE CAUTIONS AND DISASSEMBLY

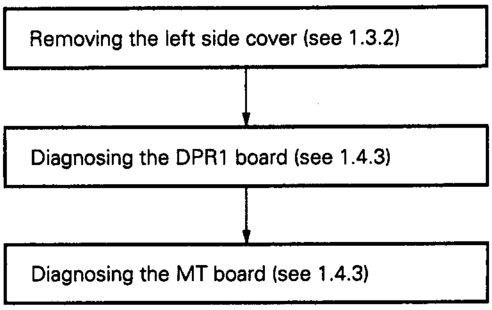
1.1 DISASSEMBLY FLOWCHART

The following flowchart shows the procedure of disassembly of the product before fault diagnosing the board assembly or replacing the optical block assembly. Be sure to turn off the power supply of the camera adapter before disassembling or assembling the product.

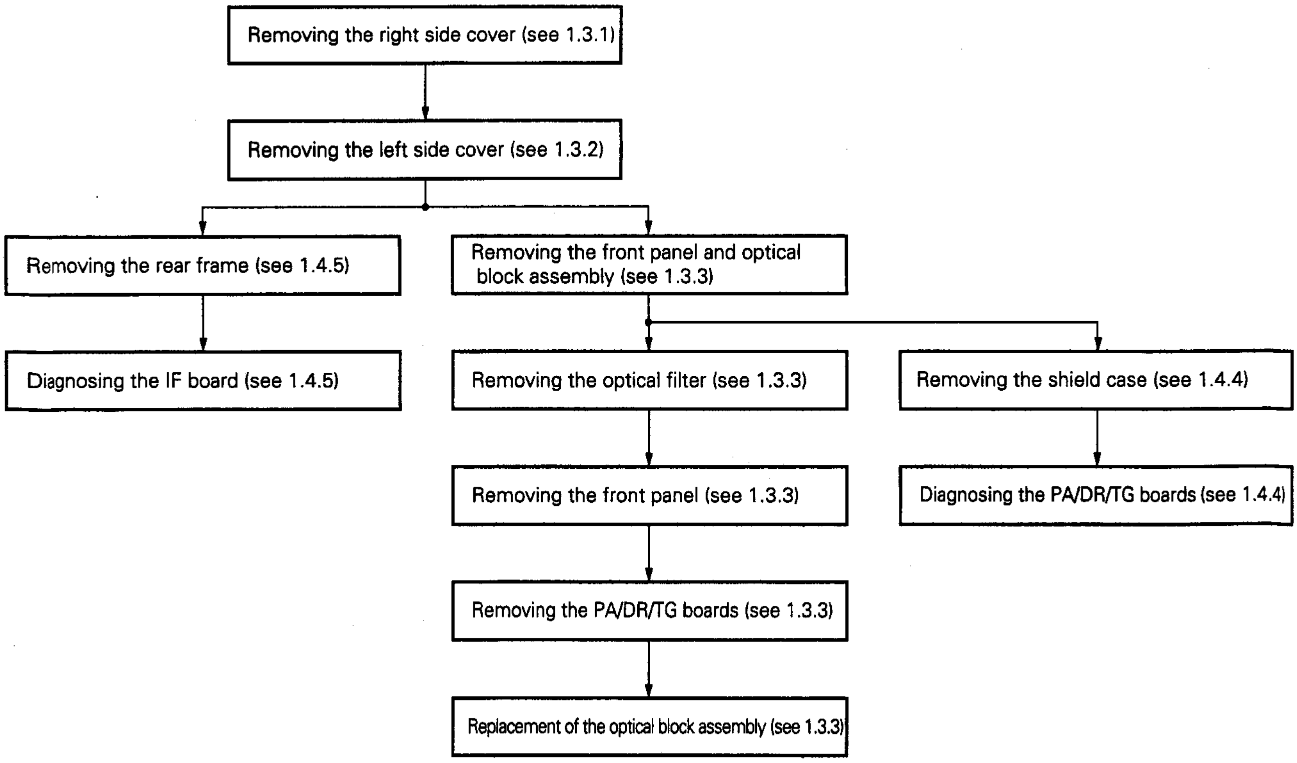
1.1.1 Disassembly flowchart for diagnosing the CP board, plug-in type circuit boards [SE/DPR2/SW. Regulator assembly]


Removing the right side cover (see 1.3.1)
Diagnosing the CP board (see 1.4.1)
Diagnosing the plug-in boards [SE/DPR2/SW.Regulator assembly] (see 1.4.2)

1.1.2 Disassembly flowchart for diagnosing the MT board


Removing the left side cover (see 1.3.2)
Diagnosing the DPR1 board (see 1.4.3)
Diagnosing the MT board (see 1.4.3)

1.1.3 Disassembly flowchart for replacing the optical block assembly and diagnosing the IF/PA/DR/TG boards


Removing the right side cover (see 1.3.1)
Removing the left side cover (see 1.3.2)
Removing the rear frame (see 1.4.5)
Removing the front panel and optical block assembly (see 1.3.3)
Diagnosing the IF board (see 1.4.5)
Removing the optical filter (see 1.3.3)
Removing the shield case (see 1.4.4)
Removing the front panel (see 1.3.3)
Diagnosing the PA/DR/TG boards (see 1.4.4)
Removing the PA/DR/TG boards (see 1.3.3)
Replacement of the optical block assembly (see 1.3.3)

1.2 POWER FUSE

The KY-D29 does not incorporate a fuse or power circuit breaker. During the use of the KA-27 camera adapter, the circuitry inside the camera head and camera adapter is protected against overcurrent by the fuse inside the KA-27.
When the camera head is integrated with a VCR, the circuitry is protected by the fuse and circuit breaker inside the VCR.
To replace the fuse, please refer to the service manual of the KA-27 or the VCR in use.

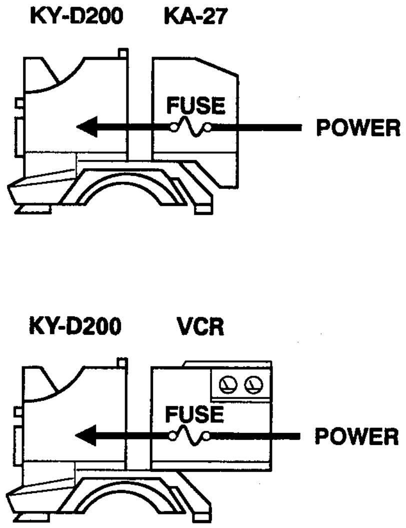


Fig. 1-2-1 Power Fuse

1.3 REMOVAL OF PRINCIPAL PARTS

1.3.1 Removing the right side cover

(1) Loosen the 4 screws ① and remove the right side cover Ⓐ.

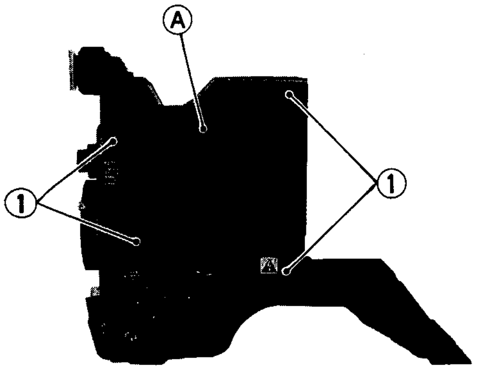


Fig. 1-3-1 Removing the Right Side Cover

1.3.2 Removing the left side cover

(1) Loosen the 4 screws ② and remove the left side cover Ⓑ.

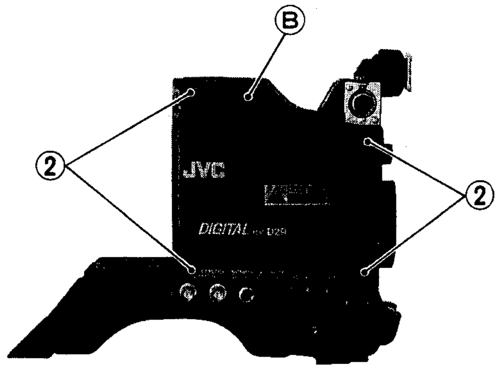


Fig. 1-3-2 Removing the Left Side Cover

1.3.3 Removing the optical filter assembly and optical block assembly

(1) Remove both side covers (see sections 1.3.1 and 1.3.2).
(2) Remove the screw ③ from the MT board on the left side and the screw ④ below it.

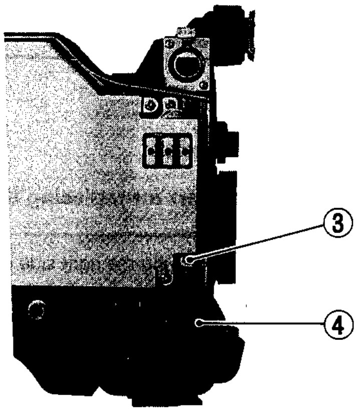


Fig. 1-3-3

(3) Remove the 2 screws ⑤ from the bottom frame.
(4) Remove the 3 screws ⑥ from the front panel.
(5) Pull out the optical block assembly together with the front panel Ⓒ gently toward the front.

NOTE
Be very careful not to scratch or damage the circuit boards and flat cables.

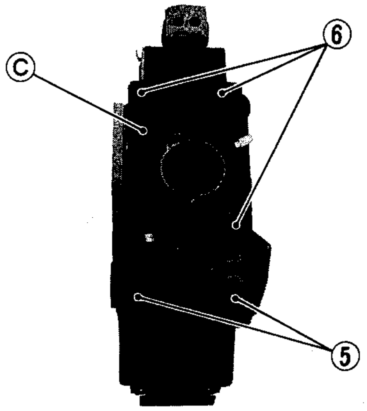
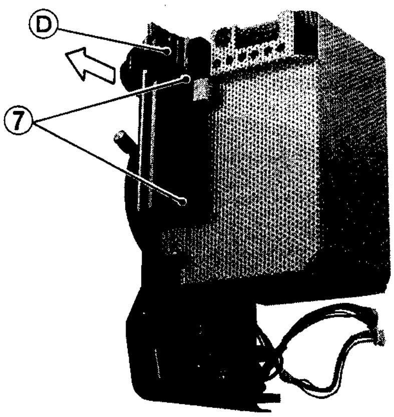


Fig. 1-3-4

(6) Loosen the 2 screws ⑦.

(7) Take out the optical filter assembly Ⓓ in the direction of the arrow.



*The shield case is not provided.

Fig. 1-3-5 Removing the Optical Filter Assembly

- Usually, the optical filter assembly does not need to be removed. However, when it is removed then attached, observe the position relationship between the filters and filter shaft as shown in Fig. 1-3-6.

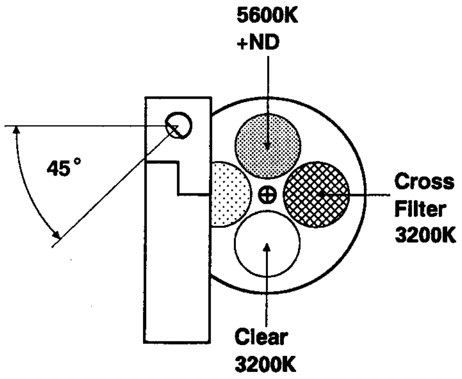


Fig. 1-3-6 Position Relationship Between Filters and Filter Shaft

(8) Remove the 4 screws ⑧ from the front panel, and separate the front panel Ⓒ from the optical block assembly.

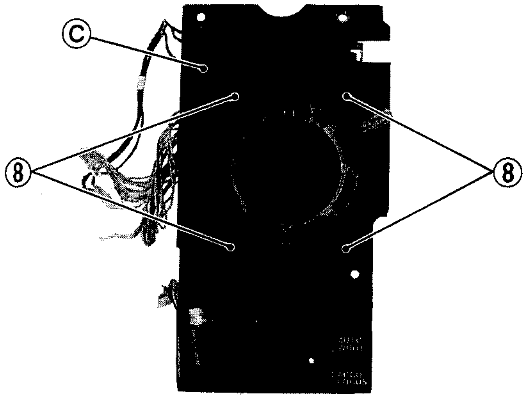


Fig. 1-3-7

(9) Remove the 2 screw ⑩ then remove the PA board.

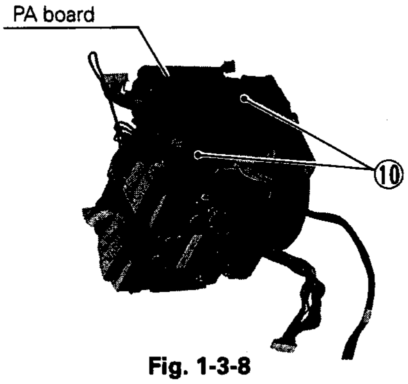


Fig. 1-3-8

(10) Remove the 2 studs ⓐ from the TG board and the 2 screws ⑨ from the DR board, then remove the TG and DR boards.

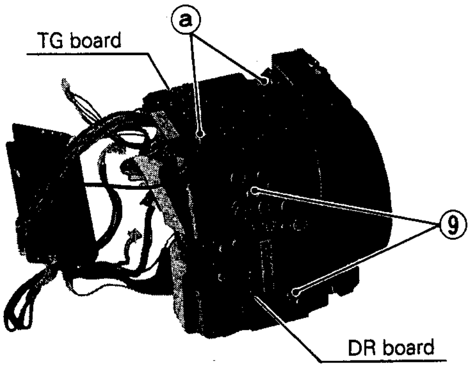


Fig. 1-3-9 Removing the Optical Block Assembly

NOTES

- **The CCDs are precision-bonded on the prisms. Therefore, even if a CCD fails, it is not possible to replace the deffective CCD alone. The entire optical block assembly should be replaced in such a case.**
- **The optical block assembly (SCM0937-N0A[NTSC]/ SCM0937-P0A[PAL]) provided as a service part is not equipped the PA, TG and DR boards. When replacing the assembly, attach the circuit boards and the bracket to the new optical block assembly before mounting it in the camera head.**

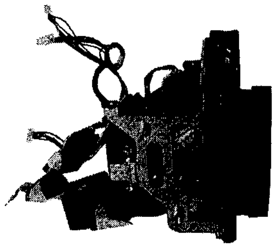


Fig. 1-3-10 Optical Block Assembly

1.4 DIASSEMBLY FOR DIAGNOSTICS OF MAIN BOARDS

1.4.1 Diassembly for diagnosing the CP board

(1) Remove the right side cover (see section 1.3.1).

(2) By removing the 2 screws ① from the CP board, the CP board can be opened as shown in Fig. 1-4-1, so that the diagnoses can be done easily.

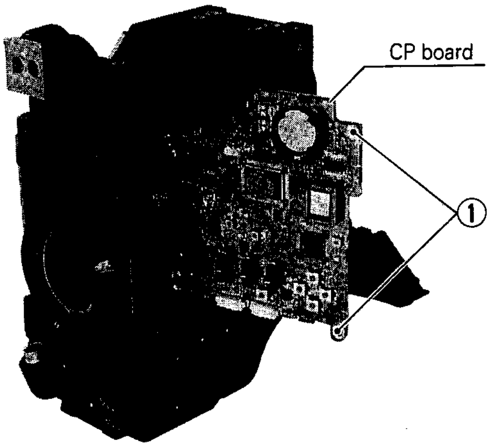


Fig. 1-4-1 CP Board

NOTE

The lower hinge of the CP board has been designed so that the board is stopped at the position where it is opened by 90 degrees. When closing the circuit board, lift it slightly to free it. Be careful not apply unnecessary force to the circuit board, for this may damage the chip components.

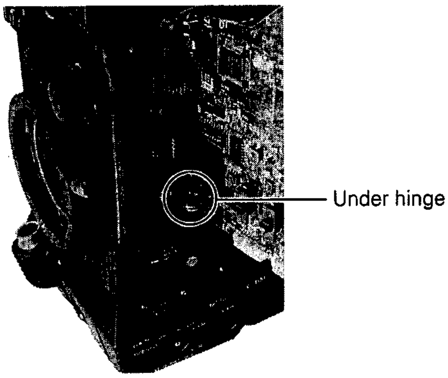


Fig. 1-4-2

1.4.2 Diassembly for diagnosing the plug-in boards [SE, DPR2,SW.Regulator assembly]

The plug-in circuit boards are connected to the MT board and requires the extension board (SCK2169) for their diagnostics.

(1) Take out the plug-in boards in the direction of the arrow by pulling them by section Ⓐ shown in the figure.

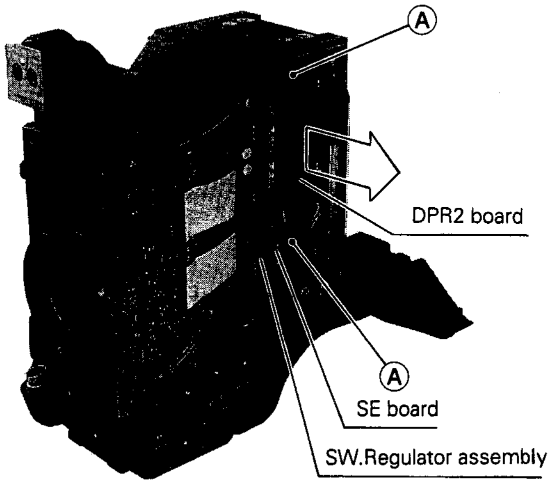


Fig. 1-4-3

(2) Connect the extension board to the MT board.

(3) Connect the removed plug-in boards to the extension board.

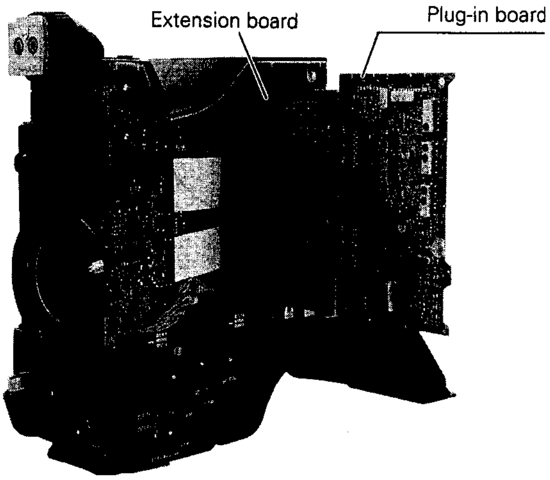


Fig. 1-4-4 Plug-in Boards

The diagnosis of the plug-in boards (SE, DPR2, SW, Regulator assembly) can be performed in the above condition. The extension of the plug-in boards should be done one by one.

NOTE

The same connectors are used for all three plug-in boards. Make sure to connect the right connector when these boards are connected to a MT board.

1.4.3 Diassembly for diagnosing the DPR1 and MT boards

(1) Remove the left side cover (see section 1.3.2).

(2) Remove the 4 screws ② then remove the shield cover Ⓑ.

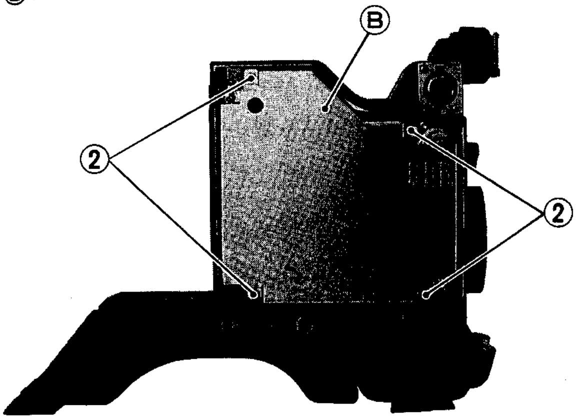


Fig. 1-4-5

(3) The DPR1 board is connected with the MT board through CN22 and CN 23. Carefully remove the DPR1 board.

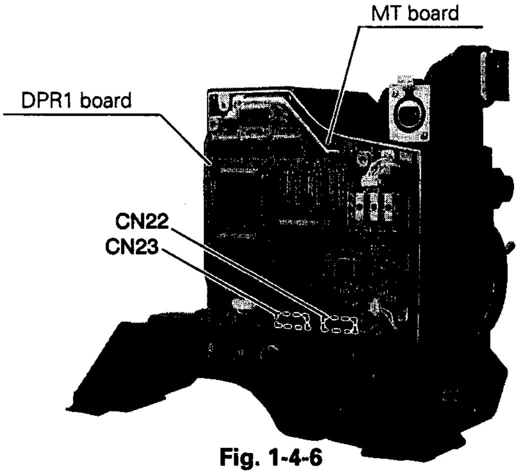


Fig. 1-4-6

(4) Remove the 4 screws ③ and the MT board shield cover Ⓒ before starting the diagnostics of the MT board.

(5) The DPR1 board can be opened by 90 degrees with respect to the connected MT board as shown in Figure 1-4-7. The diagnostics of the DPR1 and MT boards can be performed in this condition.

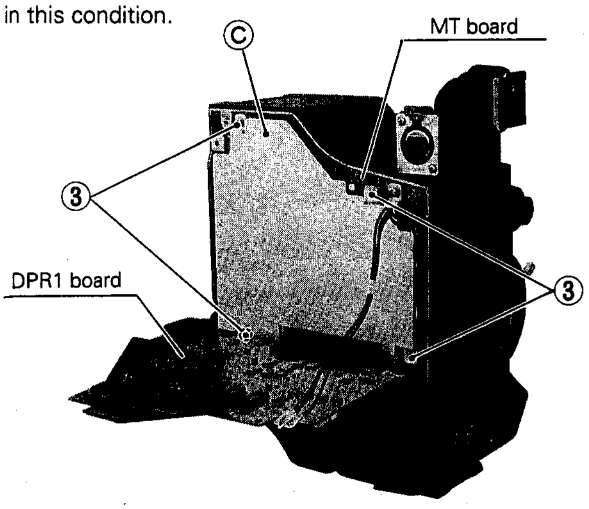


Fig. 1-4-7 DPR1 and MT Boards

(6) When attaching the circuit boards to their original condition, place the slack section of the wire connected to CN1 in the space above the optical block assembly. Also ensure that CN22 and CN23 of the DPR1 board are connected securely to the MT board.

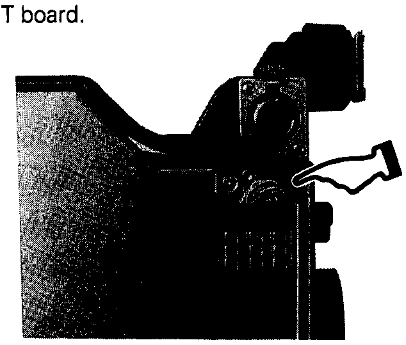


Fig. 1-4-8

1.4.4 Diassembly for diagnosing the PA, DR and TG boards

(1) By following steps (1) to (5) in section 1.3.3, remove the optical block assembly together with the front panel.

(2) By following steps (9) to (11) in section 1.3.3, remove the shield case and remove the PA, TG and DR boards.

(3) The diagnostics of the PA, DR and TG boards can be performed in this condition.

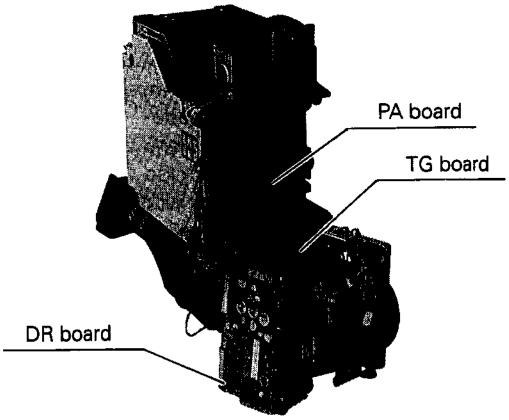


Fig. 1-4-9 PA, DR and TG Boards

1.4.5 Diassembly for diagnosing the IF board

(1) Remove both side covers (see sections 1.3.1 and 1.3.2).

(2) Remove the 2 screws ⑤ and 4 screws ⑥.

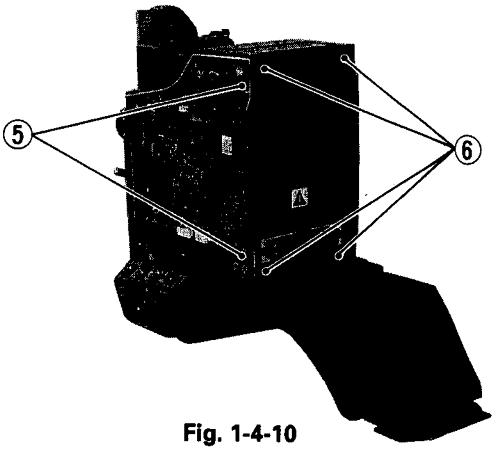


Fig. 1-4-10

(3) Open the rear frame Ⓓ and IF board in the direction of the arrow shown in the figure.
The diagnostics of the IF board can be performed in this condition.

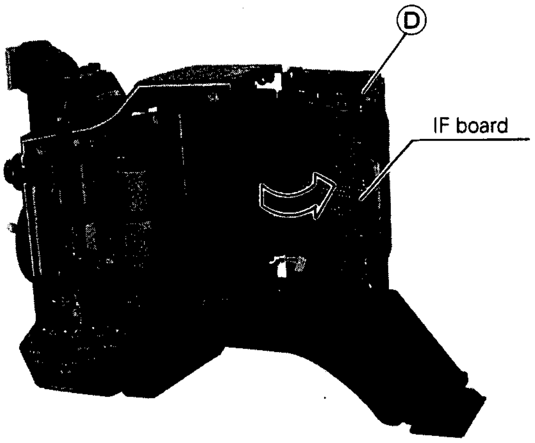


Fig. 1-4-11 IF Board

1.5 FUNCTIONS OF THE DIP SWITCH

DIP switch S12 on the CP board in the camera head have the functions as described below.

Symbol	No.	Switch Name	Function	Initial Setting	Ref. Sec.
S12	1	Adjustment mode	Adjustment mode ON/OFF	OFF	2.3
	2	Check mode	Check mode ON/OFF	OFF	1.5.2
	3	Service menu	Service menu ON/OFF	OFF	1.5.3
	4	Automatic iris	Automatic iris ON/OFF when using the remote controller	OFF (Automatic)	1.5.4
	5	Remote control unit setting SW	Refer to the section 1.12.	ON	1.12
	6	Not used	—	OFF	—
	7	Setup (Only NTSC model)	Setup ON/OFF	OFF (with set up)	1.5.5
	8	Function setting (Only NTSC model)	Initial setting of camera's function	ON	1.5.6

Table 1-5-1 Functions of S12 on the CP board

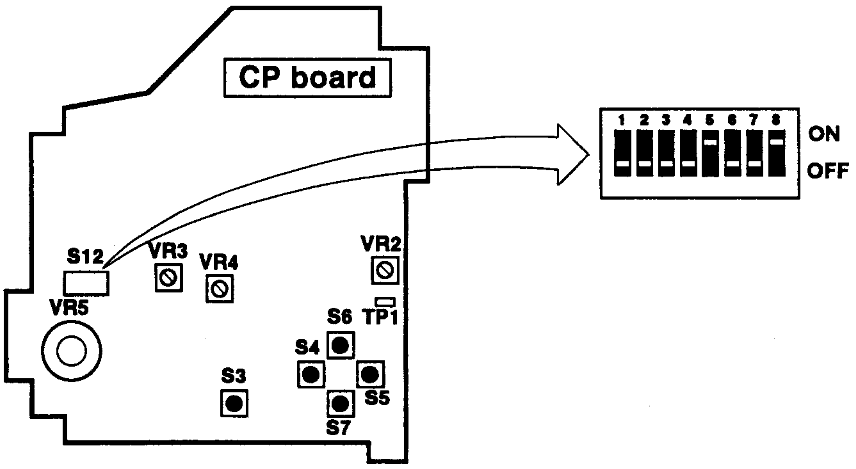


Fig. 1-5-1 Switch Layout

1.5.1 Adjustment mode (S12-1)

Setting S12-1 to ON initiates the adjustment mode.
For details of this mode, please read section "2.2 ADJUSTMENT PROCEDURE IN THE ADJUSTMENT MODE".

1.5.2 Check mode (S12-2)

Setting S12-2 to ON initiates the check mode.
This mode is used to display the auto white and auto iris adjustment data which stored in CPU, as well as to perform some electrical adjustments.

```
        ---CHECK MODE---

R-G            : **
B-G            : **
R GAIN LEVEL  : **
B GAIN LEVEL  : **
PEAK           : **
APL            : **
NAM ERROR : *
GAIN     *dB
```

Fig. 1-5-2 Check Mode Screen

- **R-G/B-G**
  This shows the R, G, B signal input to the CPU to control white balance with R-G and B-G. These should be adjusted for white balance. See 2.7.1 Adjustment of white balance for details.
- **R GAIN LEVEL/B GAIN LEVEL**
  These two items of data show the control signal level for a white balance of the R and B CHs.
- **PEAK**
  This data shows the peak-hold value of the signal in 1 vertical scanning period.
- **APL**
  This data shows the average value of video signal level.
- **NAM ERROR**
  This data shows the NAM value for use in the auto iris control.
- **GAIN**
  This data shows the GAIN value that is set by the [GAIN] switch located on the right side of the main unit. When the full automatic shooting mode is operated, "ALC" is shown.

1.5.3 Service menu (S12-3)

Setting S12-3 to ON initiates the service menu. The items in the service menus are selected by moving the cursor with the [ITEM] button located on the right side of the main unit (note that this operation method is different from the adjustment mode). The service menu items are as shown below.

```
          —SERVICE MENU—

▷CCD CORRECT            ON
 ERROR DETECT           START
 VSUB B                 *.* V
 VSUB G                 *.* V
 VSUB R                 *.* V
 WHITE CLIP             ***%
 SVP1 RAMP MODE
 SVP2 RAMP MODE
```

Fig. 1-5-3 Service Menu Screen

- **CCD CORRECT ON**
  This item is used to switch the blemish compensation (See section 7.4.3 in detail) ON and OFF. It can be switched ON/OFF by placing the cursor on this item and pressing the [UP] or [DOWN] button.
  This mode is always reset to ON when the power supply is on. The OFF setting is only available until the power supply turns off after setting this mode OFF at the [SERVICE MENU].

Setting	Function	Factory Setting
ON	Blemish compensation is activated	ON
OFF	Blemish compensation is inactivated	

- **ERROR DETECT START**
  This item detects the blemishes and sets the position to be corrected. See section 2.9 "Blemish compensation" for details.
- **V SUB B/V SUB G/V SUB R**
  These items show the V-SUB voltage values and are used in their adjustments. See section 2.8.1 "V-SUB voltage adjustments" for details.
- **WHITE CLIP**
  The data show the White Clip level for video output signal. See 2.6.1 WHITE CLIP adjustment for details.
- **SVP1/SVP2 RAMP MODE**
  Placing the cursor on one of these items outputs the ramp waveforms SVP1 (IC401) or SVP2 (IC701) respectively. These ramp waveform outputs allow checking of the digital processor.

1.5.4 Automatic iris (S12-4)

This is an auto-iris ON/OFF switch that sets the iris of the lens automatically to "AUTO" while the remote control unit is in use. For the manual operation of the iris adjustment of the lens while the remote control unit is connected or for the iris adjustment of the MD lens remote control, this switch should be set to "ON" (without using the automatic function).

1.5.5 Setup (S12-7 : Only NTSC model)

Setting S12-7 to ON/OFF allows to select whether the camera output signal is to be with setup or not. The factory setting is OFF for with the setup. The signal level does not change by changing the position of this switch. (Adjustment after switching is not necessary).

1.5.6 Function setting (S12-8 : Only NTSC model)

The initial setting described in table 1-5-3 will be switched according to the setting of S12-8.

Function		S12 – 8	
		OFF	ON
GAIN switch	•	0 dB	0 dB
	••	+6 dB	+9 dB
	•••	+9 dB	+18 dB
V. SCAN		60.5 – 249.7 Hz	60.5 – 1966.7 Hz
ALC	GAIN	0 to +12 dB	0 to +18 dB
	EEI	1/60.5 to 1/249.7s	1/60.5 to 1/249.7s
Time display		AM 12 : 00 : 00	12 : 00 : 00AM
Date display		Year/Month/Date	Date/Month/Year

Table 1-5-3 Functions of S12 – 8

The GAIN switch can be set with the [ADVANCED MENU] and the date display can be set with the [MAIN MENU].

1.5.7 Remote control unit setting switch (S12-5)

When the camera is connected with the remote control unit, this switch need to be set. See 1.12 CONNECTION WITH REMOTE CONTROL UNIT, RM-P200/RM-P300 for more details.

1.6 EEPROM

IC7 on the CP board is an EEPROM (electrically erasable and programmable read-only memory), serving to store the data as below.
If the EEPROM fails and has to be replaced, set the data as below.

- Adjusted values with [ADJUSTMENT MODE].
- Setting details for [MAIN MENU] and [ADVANCED MENU]
- Address data of blemish position
- Auto white balance data (AUTO1/AUTO2)
- V-SUB voltage data

1.7 TIME/DATE GENERATOR and S-RAM BACKUP BATTERY

The camera incorporates a time/date generator (IC8) on the CP board to output data for the clock operation and recording the accumulation of hours.
A lithium battery (BT1) is used as backup power for the time/date generator and the S-RAM, so that the data is maintained while the camera power is OFF.
The following data is written in the S-RAM (IC3).

- Time/date display condition set with the [SET (TIME/DATE)] button.
- Whether "seconds" is displayed or not.
- Switching between 12H and 24H display.
- Date display condition.

When the clock fails to show the hours correctly, the lithium battery should be replaced using the procedure as described below.

(1) Remove the right side cover (see section 1.3.1).
(2) Locate the lithium battery on the CP board.
(3) Remove the battery by pushing it temporarily downward (Fig. 1-7-1a) then sliding it in the direction of the arrow (Fig. 1-7-1b).

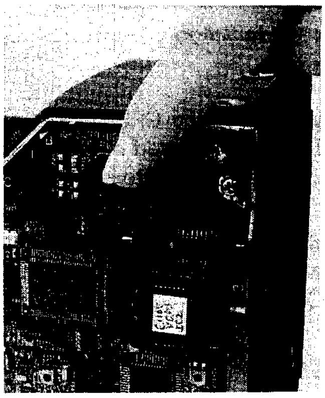


Fig. 1-7-1a

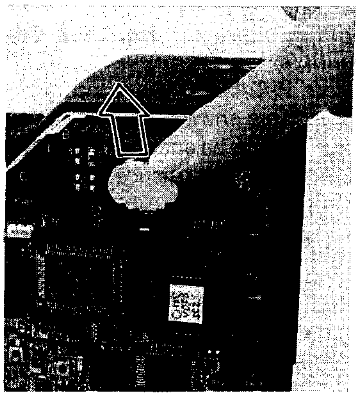


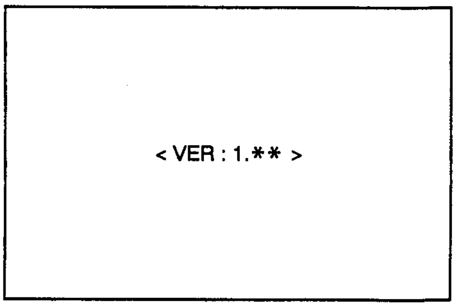
Fig. 1-7-1b

(4) Attach a new battery by reversing the removing procedure above.

Symbol	Model No.
BT1	CR2032SN

1.8 DISPLAYING VERSION NUMBERS OF THE ROMS

When the power is switched ON by the [OPERATE] switch while also pressing the [MENU] button, the version number of the ROM (IC2 on the CP board) is indicated on the viewfinder screen for 5 seconds.



```
< VER : 1.** >
```

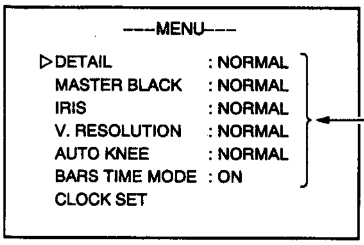
<Viewfinder screen>

1.9 SYSTEM RESET

When the power is switched ON by the [OPERATE] switch while also pressing the [SET] button, the system is reset and the data set at the MENU screen returns to the initial setting.
The items to be initialized with the system reset are shown below.

<Items which are set to be initialized>

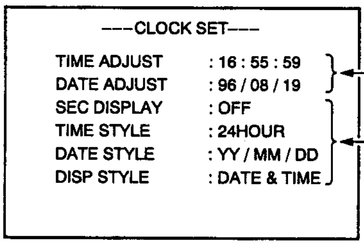
- **Setting data of [MAIN MENU]**



```
---MENU---
▷DETAIL           : NORMAL
 MASTER BLACK     : NORMAL
 IRIS             : NORMAL
 V. RESOLUTION    : NORMAL
 AUTO KNEE        : NORMAL
 BARS TIME MODE   : ON
 CLOCK SET
```

Initial setting

- **[CLOCK SET] screen**
  Date and time set at the [TIME ADJUST] and [DATE ADJUST] will not be reset.

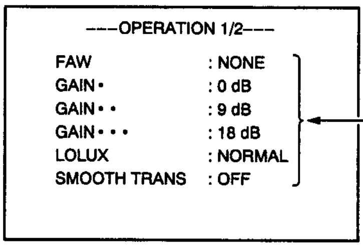


```
---CLOCK SET---
TIME ADJUST     : 16 : 55 : 59
DATE ADJUST     : 96 / 08 / 19
SEC DISPLAY     : OFF
TIME STYLE      : 24HOUR
DATE STYLE      : YY / MM / DD
DISP STYLE      : DATE & TIME
```

Will not be reset

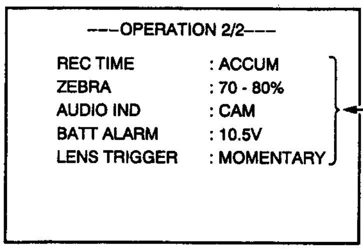
Initial setting

- **[ADVANCED MENU] screen**
  The details for FILE A and FILE B set at the [SCREEN FILE] which will be initialized.



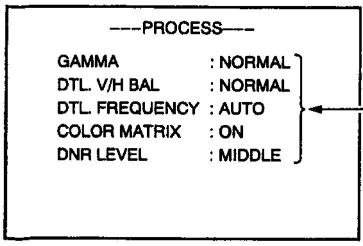
```
---OPERATION 1/2---
FAW             : NONE
GAIN•           : 0 dB
GAIN••          : 9 dB
GAIN•••         : 18 dB
LOLUX           : NORMAL
SMOOTH TRANS    : OFF
```

Initial setting



```
---OPERATION 2/2---
REC TIME        : ACCUM
ZEBRA           : 70 - 80%
AUDIO IND       : CAM
BATT ALARM      : 10.5V
LENS TRIGGER    : MOMENTARY
```

Initial setting



```
---PROCESS---
GAMMA           : NORMAL
DTL. V/H BAL    : NORMAL
DTL. FREQUENCY  : AUTO
COLOR MATRIX    : ON
DNR LEVEL       : MIDDLE
```

Initial setting

- **Other initial setting**

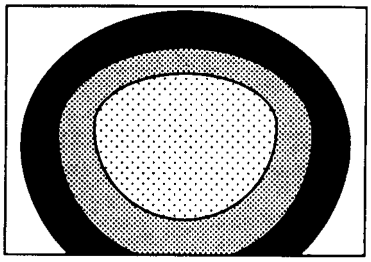
Functions	Initial setting values
SHUTTER	1/100 (NTSC), 1/120 (PAL)
DISP STATUS	Status Mode 0
SAFETY ZONE	Mode 0 (OFF)
LOLUX	OFF
FAS	OFF
V.SCAN	1/100.2 (NTSC), 1/120.1 (PAL)
Display of date/time	OFF (not displayed)

<Items of which the setting will not be initialized>

- **Setting data for [CHECK MODE], [SERVICE MENU] and [ADJUSTMENT MODE].**
- **Memory data of AUTO WHITE BALANCE**
- **Settings for mechanical switches**

1.10 MULTIZONE DESIGN

The exposure detection system used for the Auto Iris is based on a multizone pattern that assigns a priority according to the probable important subject area.
Further from the center zone of these fields the importance of a bright object is less, and therefore will not disturb the automatic settings unnecessarily.



Multi Zone Iris Detection

<How to confirm the multi zone>

(1) To visualize the multi zone in the viewfinder and monitor screen, hold the [ITEM] button on the right side while turning power on to the camera, with the [OPERATE] switch.
(2) Turn off the camera to clear the display.

1.11 CONNECTION WITH RM-P270, TRIAXIAL UNIT

When automatic function which not available in the camera is activated by RM-P270, triaxial unit with local remote control, the all function may be locked. To avoid the problem, the EPROM (IC803 on RMT board) of triaxial should be updated.

Model	Affected serial number	New ROM
RM-P270U RM-P270E	#0086 and before. #0092 and before.	PLSC1062-V1-3 or higher. PLSC1062-V1-3 or higher.

1.12 CONNECTION OF REMOTE CONTROL UNIT, RM-P200/P300

1.12.1 Connection of RM-P300

When camera is operated with RM-P300, the power may not be turned on or even turned on, then all function may be locked. This phenomena may happen depend on length of the cable and power consumption of lens and viewfinder. To avoid this, internal switches have to be set as follows.

1. Internal switches

Model	Switches	Initial setting
KY-D29	S12-5 on CP board	ON
PM-P300	S801 on RM board	OFF

2. Switches setting

Lens: A14 X 10 BERM, Viewfinder : VF-P550B

Cable Length(m)	20	50	100	150	200	220	250
S12-5	ON	ON	ON	ON	OFF	OFF	OFF
S801	OFF	OFF	ON	ON	ON	ON	ON

Lens: A14 X 10 BERM, Viewfinder VF-P115/VF-P116/VF-P400

Cable Length(m)	20	50	100	150	200	220	250
S12-5	ON	ON	ON	ON	ON	ON	ON
S801	OFF	OFF	OFF	OFF	ON	ON	ON

NOTE

- **The cable between KY-D29 and RM-P300 should be up to 250m.**
- **The big lenses, such as EFP lens can not be used.**

3. The function of the switches

- S12-5 on KY-D29

  There are two different power system in this camera. The one is power for CPU only and other one is for camera except CPU. The dip switch change the mode as follows.

S12-5	Mode of power supply
ON	Power supplied to CPU and others at the same time.
OFF	The power supplied to CPU first, and then, power do not supplied until the voltage from remote unit become 12 V.

- S801 on RM-P300

  The RM-P300 supply power to camera and change the voltage depend on length of cable. The switch changes initial voltage to the camera.

S801	Initial voltage
ON	18.5 V
OFF	15 V

1.12.1 Connection of RM-P200

Lens: A14 X 10 BERM, Viewfinder : VF-P400/VF-P115/VF-P116

Cable length	0 – 100m
S12-5	ON

NOTE

VF-P550, 5.5 inch viewfinder, can not be used with RM-P200.

SECTION 2
ELECTRICAL ADJUSTMENTS

2.1 REQUIRED EQUIPMENT FOR ELECTRICAL ADJUSTMENT

2.1.1 General instruments necessary for adjustment

(1) Lighting equipment (3200K, halogen lamp)
(2) DC voltmeter (A digital voltmeter is recommended.)
(3) Oscilloscope (2 or more channels, 100 MHz or higher bandwidth)
(4) Frequency counter
(5) Color monitor
(6) Waveform monitor
(7) Vectorscope:
    1720SCH(NTSC)/1721SCH(PAL), 1780R(NTSC)/1781R(PAL) [Tektronix] or equivalent (An instrument having the SC-H measurement function is recommended.)
(8) Power supply: 12 V DC (using the AA-P250 AC power adapter or equivalent)
(9) Lens (A14x10BRM12 or equivalent)
(10) Camera adapter, KA-27 or Dockable VTR (see *Note)
(11) Viewfinder: VF-P116 or equivalent

***NOTE**

The power to the camera head is supplied through the 50-pin connector on the rear.
Therefore, the Camera Adapter KA-27 or dockable VTR must be used to carry out adjustments.

2.1.2 Special implements required for adjustment

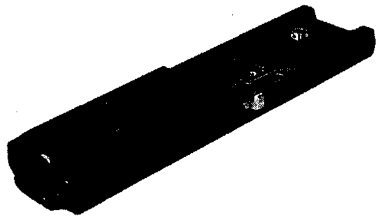
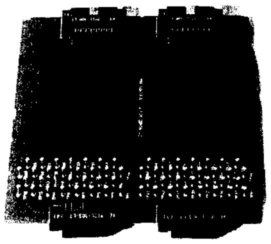
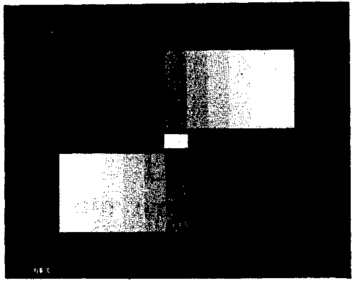
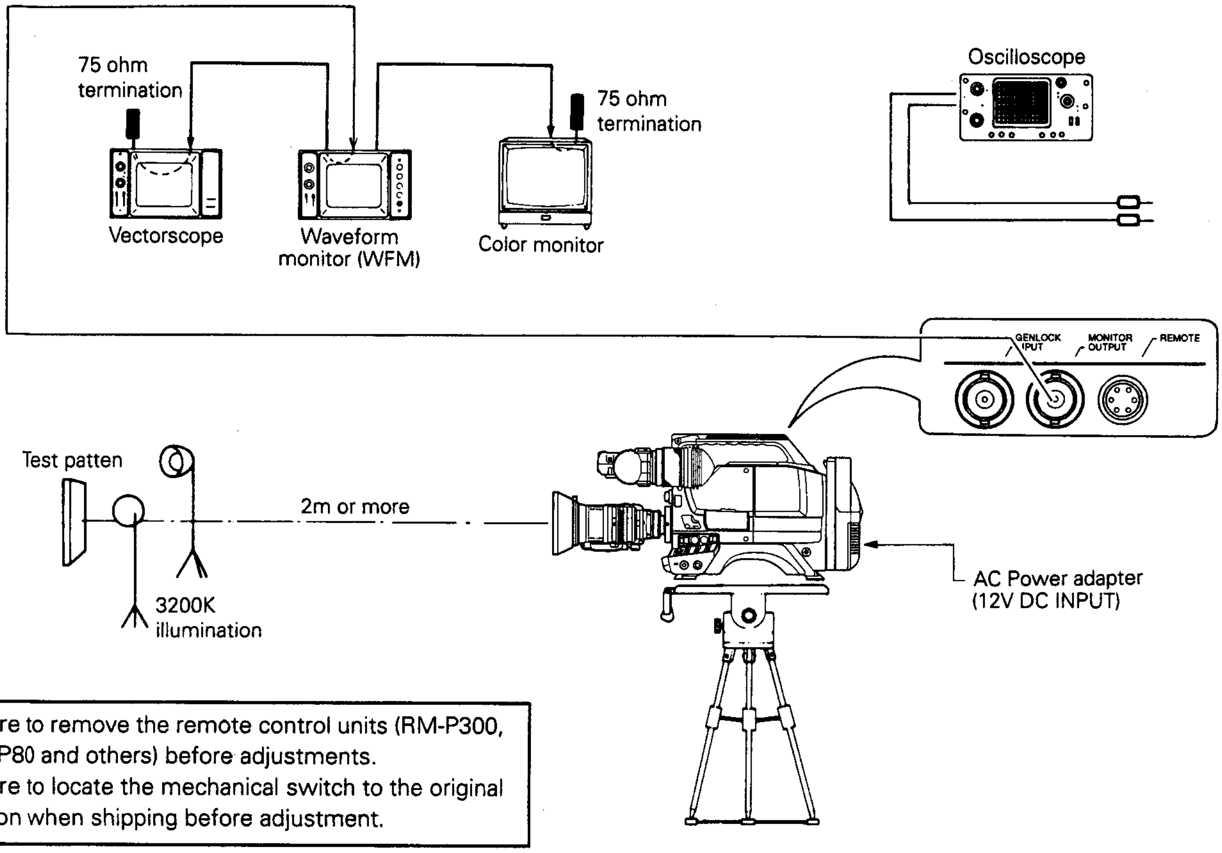
1	Tripod base	2	Extension board, 60-pin	3	Gray scale chart
(KA-510: accessory) 		(Part No.:SCK2169) 		(Part No.: GS2L) 	

Fig. 2-1-1 Special inplements required for adjustment

2.1.3 Standard setup


75 ohm termination
Vectorscope
Waveform monitor (WFM)
Color monitor
75 ohm termination
Oscilloscope
GENLOCK INPUT
MONITOR OUTPUT
REMOTE
Test patten
2m or more
3200K illumination
AC Power adapter (12V DC INPUT)

- Be sure to remove the remote control units (RM-P300, RM-LP80 and others) before adjustments.
- Be sure to locate the mechanical switch to the original position when shipping before adjustment.

Fig. 2-1-2 Standard Setup

2.1.4 Potentiometers and test point layout

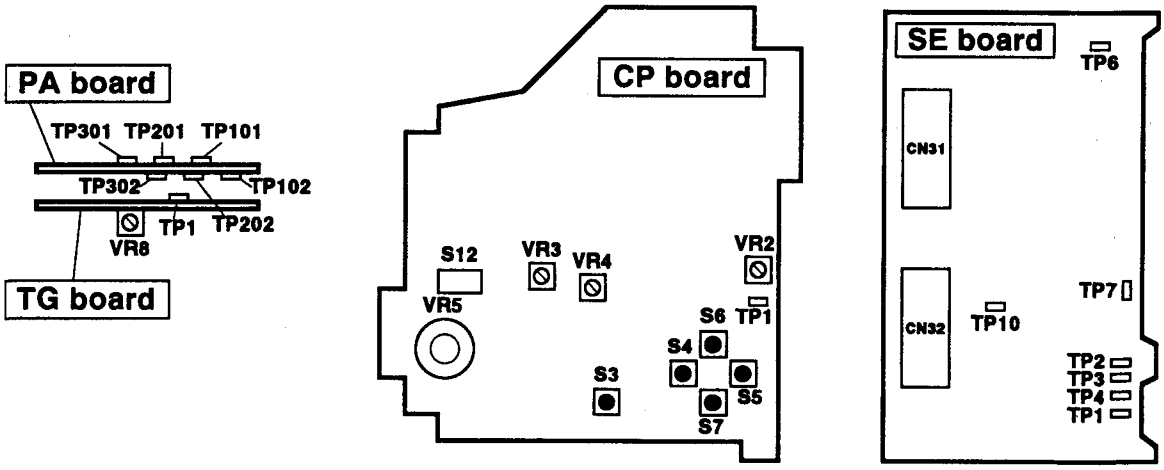

PA board
TP301
TP201
TP101
TP302
TP102
VR8
TP1
TP202
TG board
CP board
S12
VR3
VR4
VR2
VR5
S6
TP1
S4
S3
S5
S7
SE board
TP6
CN31
CN32
TP10
TP7
TP2
TP3
TP4
TP1

Figure 2-1-3 Potentiometers and Test Points on the Circuit Boards

2.2 ADJUSTMENT PROCEDURE IN THE ADJUSTMENT MODE

Some of the adjustment items should be adjusted in the "adjustment mode".

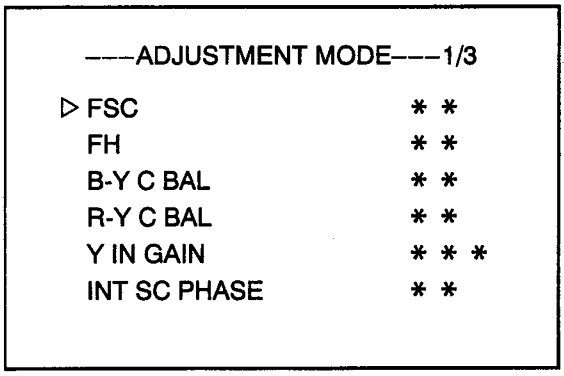
The adjustment mode allows to select an item on the monitor screen and adjust all of the required adjustments by using one potentiometer. The functions affected by each adjustment item are set automatically and the mechanical switch settings may be ignored. The adjustment procedure in the adjustment mode is described below.

(1) Remove the right side cover.(See Section 1.3.1)
(2) Set S12-1 on the CP board to ON to activate overlay display.
(3) Select the adjustment item by pushing S6 and/or S7 on the CP board. (A blinking cursor is displayed on the left of selected item.)
(4) Adjust the selected item with VR5 (AUDIO LEVEL control potentiometer) on the CP board. The adjusted value is displayed in the range between -128 and 127 or between -25 and 25. ("FET ADJUST" is displayed between 0.00 V and 1.00 V.)
(5) Setting S12-1 to OFF terminates the adjustment mode and returns the monitor to the normal screen.

When the cursor is moved to another item or S12-1 is set to OFF, the adjusted data is stored in EEPROM (IC7 on the CP board). The data is then delivered to the camera when the power is turned on.

***NOTE**

In the adjustment mode, the reference values are automatically set to necessory parameters when adjusting. Adjust items sequentially from top to bottom of the menu display.



```
---ADJUSTMENT MODE---1/3

▷ FSC                 * *
  FH                  * *
  B-Y C BAL           * *
  R-Y C BAL           * *
  Y IN GAIN           * * *
  INT SC PHASE        * *
```

Fig. 2-2-1 Adjustment Mode Screen (1/3)

Adjustment Item	Page
FSC	1/3
FH	
B-Y C BAL	
R-Y C BAL	
Y IN GAIN	
INT SC PHASE	
B BLACK	2/3
R BLACK	
MASTER BLACK	
DY SH B	
DY SH G	
DY SH R	
IN-GAIN G	
IN-GAIN B	
IN-GAIN R	
FLARE G	3/3
FLARE B	
FLARE R	
ABL ADJUST	
LOLUX BLACK B	
LOLUX BLACK R	
LOLUX M.BLACK	
FET ADJUST	

Table 2-2-1 Adjustment Items in the Adjustment Mode

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (⇧) Adjustment level (☆)	Adjustment procedure

2.3 SSG ADJUSTMENT

• Confirm that no external sync is input to the camera.

1	Fsc adjustment	• Frequency counter	• ADJUSTMENT MODE ↓ "FSC" (Color bar output)	◎ TP10 [SE] ⇧ VR5 [CP] <NTSC> ☆ 3,579,545±10Hz <PAL> ☆ 4,433,618±10Hz	(1) Extend the SE board by using the extension board. (2) Initiate the adjustment mode and select "FSC". (3) Adjust so that the SC frequency at the measurement point becomes equal to the specified level.
2	F_H adjustment	• Digital voltmeter	• ADJUSTMENT MODE ↓ "FH" (Color bar output)	◎ TP1 [SE] ⇧ VR5 [CP] ☆ 2.5 V	(1) Initiate the adjustment mode and select "FH". (2) Adjust so that the error voltage of F_H.oscillator at the measurement point becomes equal to the specified level.

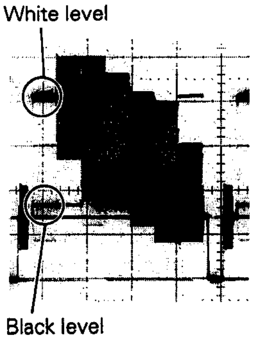
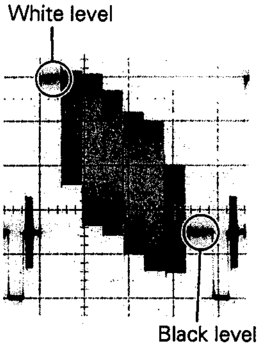
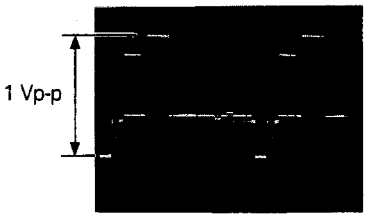
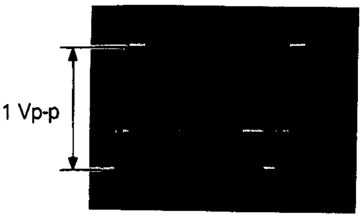
2.4 ERROR VOLTAGE ADJUSTMENT

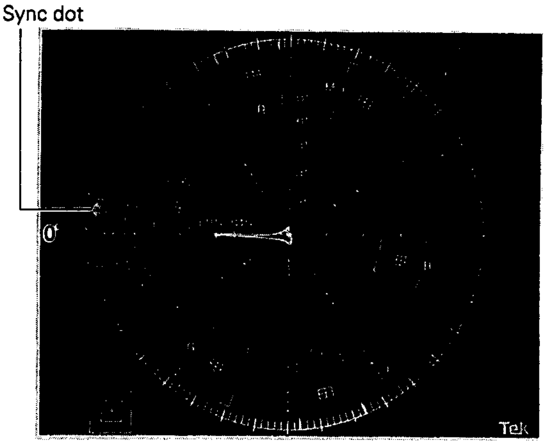
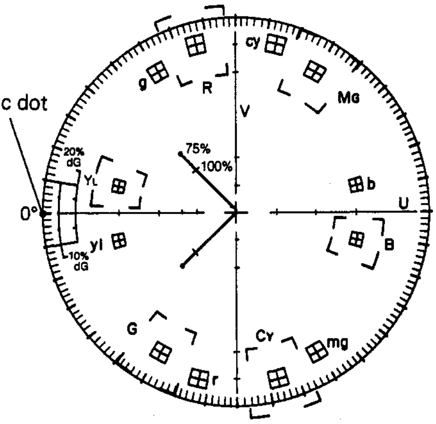
• Confirm that no external sync is input to the camera.

1	Error voltage adjustment for TG drive Osc.	• Digital voltmeter		◎ TP1 [TG] ⇧ E_{oo}(VR8) [TG] ☆ 2.5 V	(1) Adjust so that the error voltage at the measurement point be comes equal to the specified level.
2	Error voltage adjustment for Area gate generate Osc.	• Digital voltmeter		◎ TP1 [CP] ⇧ E_{oo}ADJ(VR2) [CP] ☆ 2.5 V	(1) Adjust so that the error voltage at the measurement point be comes equal to the specified level.

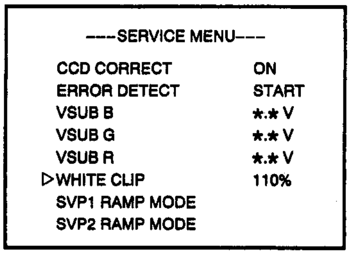
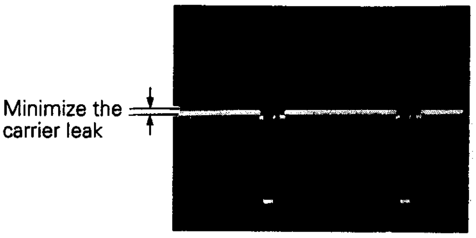
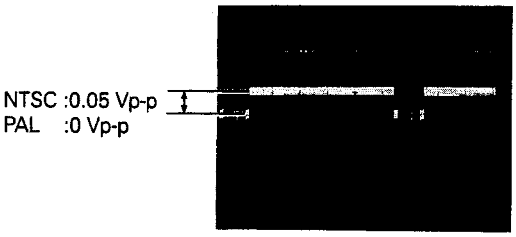
No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (⇧) Adjustment level (☆)	Adjustment procedure

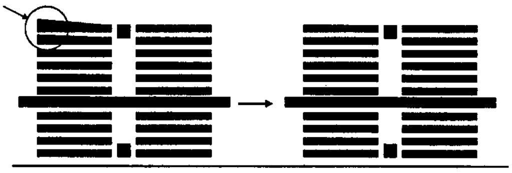
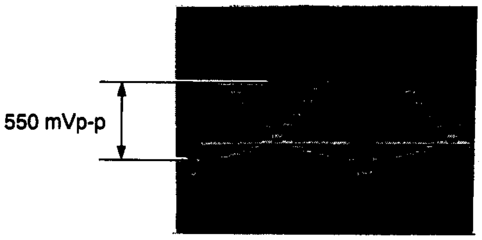
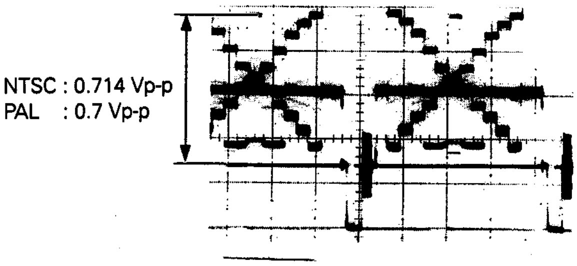
2.5 ENCORDER ADJUSTMENT

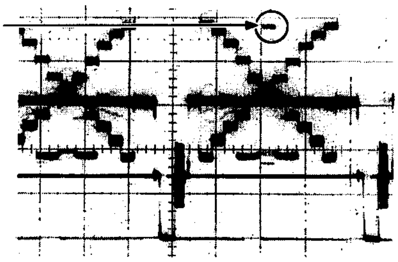
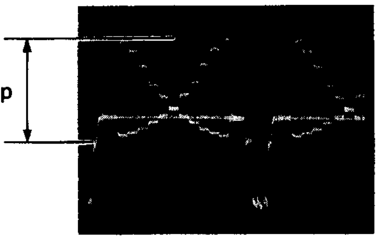
1	B-Y C BAL adjustment	• Oscilloscope (H-rate)	• ADJUSTMENT MODE ↓ "B-Y C BAL" (Color bar output)	◎ MONITOR OUTPUT terminal (75Ω terminated) ⇧ VR5 [CP] ☆ Min. carrier leaks	(1) Initiate the adjustment mode and select "B-Y C BAL". (2) Adjust to minimize the carrier leaks in the white and black sect ions of the color bars.
	 [NTSC]			 [PAL]	
2	R-Y C BAL adjustment	• Oscilloscope (H-rate)	• ADJUSTMENT MODE ↓ "R-Y C BAL" (Color bar output)	◎ MONITOR OUTPUT terminal (75Ω terminated) ⇧ VR5 [CP] ☆ Min. carrier leaks	(1) Initiate the adjustment mode and select "R-Y C BAL". (2) Adjust to minimize the carrier leaks in the white and black sect ions of the color bars.
3	Y IN GAIN adjustment	• Oscilloscope (H-rate)	• ADJUSTMENT MODE ↓ "Y IN GAIN" (Color bar output)	◎ MONITOR OUTPUT terminal (75Ω terminated) ⇧ VR5 [CP] ☆ 1 Vp-p	(1) Initiate the adjustment mode and select "Y IN GAIN". (2) Adjust so that the Y level of compsite signal at the measurement point becomes equal to the specified level.
			 [NTSC]  [PAL]		

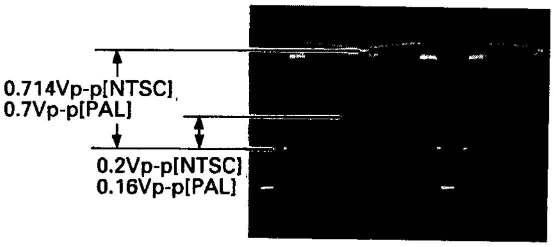
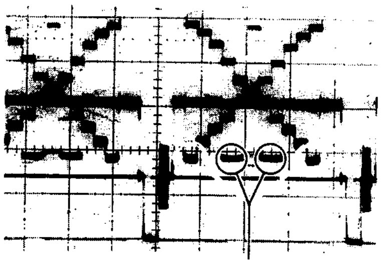
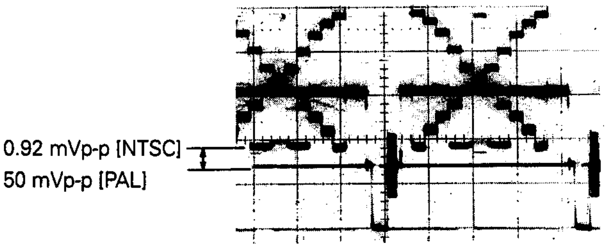
No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure
4	C GAIN adjustment	• Oscilloscope (H-rate)	• Color bar output	◎ MONITOR OUTPUT terminal (75Ω terminated) Ⓣ VR1 [SE] <NTSC> ☆ 0.286 Vp-p <PAL> 0.3 Vp-p	(1) Output the color bar signal. (2) Adjust so that the output signal burst level at the measurement point becomes equal to the specified level.
5	INT SC PHASE adjustment	• Vectorscope with SC-H measuring facility	• ADJUSTMENT MODE ↓ "INT SC PHASE" (Color bar output)	◎ MONITOR OUTPUT terminal (75 Ω terminated) Ⓣ VR5 [CP] ☆ 0°	**• This adjustment is usually not necessary to be done. Perform it only when it is required to do so, as after replacement of EEPROM. If the SC-H measuring instrument is not available, set the adjustment value to 0.** **• When perform the adjustment, confirm that no external sync is input to the camera.** (1) Set to the adjustment mode and select "INT SC PHASE". (2) Set the vectorscope to SC-H mode. (3) Adjust the PHASE knob for the phase adjustment of the vectorscope and set the burst signal to the correct position. (4) Read the position of the sync dot on the outer dial scale and perform the coarse adjustment with the SC COARSE VR on the left side of the main unit. (In adjustment mode, the SC COARSE VR functions as an internal SC COARSE control.) (5) Adjust with VR5 so that the sync dot is positioned in the measured value.
		Sync dot  [NTSC] Sync dot  0° 20% dG 10% dG 75% 100% R V cy Mg g YL b U yl B G Cy mg r [PAL]			

2.6 VIDEO PROCESS ADJUSTMENT

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure
1	WHITE CLIP adjustment	•Video monitor	•SERVICE MENU ↓ " WHITE CLIP"	◎ MONITOR OUTPUT terminal (75Ω terminated) Ⓣ UP(S6),DOWN(S7) button[CP] ☆ 110% (Initial setting)	**Note:** **The white clip has been adjusted at 110% as initial setting. Re-adjust white clip level according to the procedure, when required.** (1) Set S12-SW3 on the CP board to ON to initiate the service menu. (2) Place the cursor on "WHITE CLIP" using the [ITEM] button. (3) While observing the monitor screen, adjust so that the value of "WHITE CLIP" becomes 98% to 110% using the UP/DOWN button. (4) Set S12-SW3 to "OFF".
		 ---SERVICE MENU--- CCD CORRECT ON ERROR DETECT START VSUB B *.* V VSUB G *.* V VSUB R *.* V ▷WHITE CLIP 110% SVP1 RAMP MODE SVP2 RAMP MODE			
2	B/R BLACK adjustments	• Oscilloscope (H-rate) or WFM • Lens cap	• ADJUSTMENT MODE ↓ "B BLACK" ↓ "R BLACK" (Iris closed)	◎ MONITOR OUTPUT terminal (75Ω terminated) Ⓣ VR5 [CP] ☆ Min. carrier leaks (less than 15mVp-p [2 IRE])	(1) Initiate the adjustment mode and select "B BLACK". (2) Adjust to minimize the waveform carrier leak at the measurement point (less than 15 mVp-p). (3) Select "R BLACK". (4) Perform the same adjustment as step (2).
					
3	MASTER BLACK adjustment	• Oscilloscope (H-rate) or WFM • Lens cap	• ADJUSTMENT MODE ↓ "MASTER BLACK" (Iris closed)	◎ MONITOR OUTPUT terminal (75Ω terminated) Ⓣ VR5 [CP] <NTSC> ☆ 0.05 Vp-p (7.5 IRE) <PAL> ☆ 0 Vp-p	(1) Initiate the adjustment mode and select "MASTER BLACK". (2) Adjust so that the master black level at the measurement point is equal to the specified level.
					

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure
4	DYNAMIC SHADING adjustment	• Oscilloscope (V-rate) or WFM • Gray scale chart (Just scan)	• ADJUSTMENT MODE ↓ "DY SH B" ↓ "DY SH G" ↓ "DY SH R"	◎ MONITOR OUTPUT terminal (75Ω terminated) Ⓣ VR5 [CP] ☆ Flat (horizontal) white level	(1) Initiate the adjustment mode and select "DY SH B". (2) Shoot the gray scale chart and set the lens iris so that the white level is equal to 0.57 Vp-p (80 IRE). (3) Adjust so that the white level, at the measurement point, of the gray scale chart becomes flat (horizontal). (4) Select "DY SH G" and adjust the G CH dynamic shading adjustment with the same operation as step (3). (5) Select "DY SH R" and adjust the R CH dynamic shading adjustment with the same operation as step (3).
					
5	IN GAIN adjustments	• Oscilloscope (H-rate, 10:1) • Gray scale chart (Just scan)	• ADJUSTMENT MODE ↓ "IN GAIN G"	◎ TP202 [PA] Ⓣ Lens iris ☆ 550 mVp-p	(1) Initiate the adjustment mode and select "IN GAIN G". (2) Shoot the gray scale. (3) Adjust the lens iris so that the gray scale waveform level at the measurement point is equal to the specified level.
					
		• Oscilloscope (H-rate) or WFM • Gray scale chart (Just scan)		◎ MONITOR OUTPUT terminal (75Ω terminated) Ⓣ VR5 [CP] <NTSC> ☆ 0.714 Vp-p (100 IRE) <PAL> ☆ 0.7Vp-p	(4) Adjust so that the gray scale waveform level at the measurement point is equal to the specified level.
					

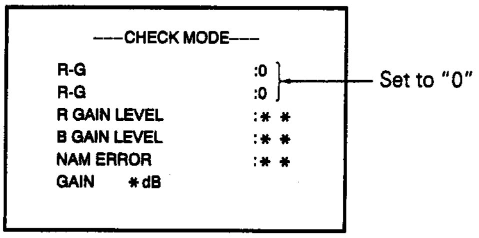
No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (⇧) Adjustment level (☆)	Adjustment procedure
5	IN GAIN adjustments	• Oscilloscope (H-rate) or WFM • Gray scale chart (Just scan)	• ADJUSTMENT MODE ↓ "IN GAIN B" ↓ "IN GAIN R"	◎ MONITOR OUTPUT terminal (75Ω terminated) ⇧ VR5 [CP] ☆ Min. carrier leaks (less than 15 mVp-p [2 IRE])	(5) Initiate the adjustment mode and select "IN GAIN B". (6) Adjust to minimize the carrier leak at the measurement point of the white section of the gray scale chart. (7) Select "IN GAIN R" and perform the same adjustment as step (6).
		 Minimize the carrier leak			
		• Oscilloscope (H-rate, 10:1) • Gray scale chart (Just scan)		◎ TP101/TP201/TP301 [PA] ☆ 0.3 ± 0.03 Vp-p	(8) Check that the gray scale waveform level at each measurement point is 0.3 ± 0.03 Vp-p. If any level is out of specification, review "2.5 Encoder Adjustment" again and restart this adjustment from step (1). (9) Adjust "3. DYNAMIC SHADING adjustments" again (fine adjustments).
		 0.3±0.03Vp-p			

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (⇧) Adjustment level (☆)	Adjustment procedure
6	FLARE adjustment	• Oscilloscope (H-rate) or WFM • Gray scale chart (Just scan)	• ADJUSTMENT MODE ↓ "FLARE G"	◎MONITOR OUTPUT terminal (75Ω terminated) ⇧VR5 [CP] <NTSC> ☆0.2Vp-p [28 IRE] <PAL> ☆0.16Vp-p	(1) Initiate the adjustment mode and select "FLARE G". (2) Shoot the gray scale chart and set the lens iris so that the cross point level is equal to 0.714 Vp-p [100 IRE](NTSC)/0.7Vp-p(PAL). (3) Adjust so that the level, at the measurement point, of the black section at the center of the gray scale chart becomes equal to the specified level.
					
		• Oscilloscope (H-rate) • Gray scale chart (Just scan)	• ADJUSTMENT ↓ "FLARE B" ↓ "FLARE R"	◎ MONITOR OUTPUT terminal (75Ω terminated) ⇧ VR5 [CP] ☆ Min.carrier leaks (less than 20mVp-p)	(4) Select "FLARE B" and adjust to minimize the carrier leak of the black section at the center of the gray scale chart. (5) Select "FLARE R" and perform the same adjustment as step (5). (6) Set S12-SW1 to "OFF".
		 Minimize the carrier leak			
7	ABL (Auto Black Level) adjustment	• Oscilloscope (H-rate) or WFM • Gray scale chart (Just scan)	• ADJUSTMENT MODE ↓ "ABL ADJUST"	◎ MONITOR OUTPUT terminal (75Ω terminated) ⇧ VR5[CP] <NTSC> ☆ 0.92 mVp-p [13±2 IRE] <PAL> ☆ 50 mVp-p	(1) Initiate the adjustment mode and select "ABL ADJUST". (2) Shoot the gray scale chart and set the lens iris so that the white level is equal to 0.714Vp-p[100 IRE](NTSC)/0.7Vp-p(PAL). (3) Adjust so that the level, at the measurment point, of black section at the center of the gray scale chart becomes equal to the specified level.
					

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure
8	BLACK adjustment	• Oscilloscope (H-rate) • Lens cap	• ADJUSTMENT MODE ↓ "FET ADJUST" ↓ "LOLUX BLACK B" ↓ "LOLUX BLACK R"	◎ MONITOR OUTPUT terminal (75Ω terminated) Ⓣ VR5[CP] ☆ Min.carrier leaks	**Note:** **Put both side covers on to camera to shut the light off to CCD sensor.** (1) Close the lens with the lens cap. (2) Select "FET ADJUST" in the adjustment mode, and set the data to "1.00 V". (3) Select "LOLUX BLACK B". (4) Adjust to minimize the waveform carrier leak at the measurment point. (5) Select "LOLUX BLACK R". (6) Perform the same adjustment as step (2).
		• Oscilloscope (H-rate) • Lens cap	• ADJUSTMENT MODE ↓ "LOLUX M.BLACK"	◎ MONITOR OUTPUT terminal (75Ω terminated) Ⓣ VR5[CP]	(7) Select "LOLUX M.BLACK". (8) Adjust so that the master black level, at the measurment point, of waveform carrier leak becomes 1/3 level of the maximum amplitude.
		• Oscilloscope (H-rate) or WFM • Gray scale chart (Just scan)	• ADJUSTMENT MODE ↓ "FET ADJUST" ↓ "LOLUX M.BLACK"	◎ MONITOR OUTPUT terminal (75Ω terminated) Ⓣ VR5[CP] ☆ Cross point : <NTSC> 0.36 Vp-p [50 IRE] <PAL> 0.35 Vp-p	(9) Select "FET ADJUST" again. (10) Shoot the gray scale chart and set the lens iris so that the white level is equal to 0.714 Vp-p [100 IRE] (NTSC)/0.7 Vp-p (PAL) . (11) Adjust so that the level, at the measurment point, of cross point of the gray scale chart becomes equal to the specified level. (12) Put the lens cap on and then, adjust (7) and (8) alternately to set Master Black level precisely.

2.7 CP ADJUSTMENT

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (Ⓣ) Adjustment level (☆)	Adjustment procedure
1	WHITE BALANCE adjustment	• Video monitor	• CHECK MODE	◎ MONITOR OUTPUT terminal (75Ω terminated) Ⓣ B.ADJ (VR3) [CP] ☆ B-G : 0 Ⓣ R.ADJ (VR4) [CP] ☆ R-G : 0	(1) Set S12-SW2 on the CP board to ON to initiate the check mode (2) Adjust VR3 so that the B-G value displayed on the monitor screen becomes "0". (3) Similarly, adjust VR4 so that the R-G value becomes "0". (4) Set S12 SW2 to "OFF".


---CHECK MODE---

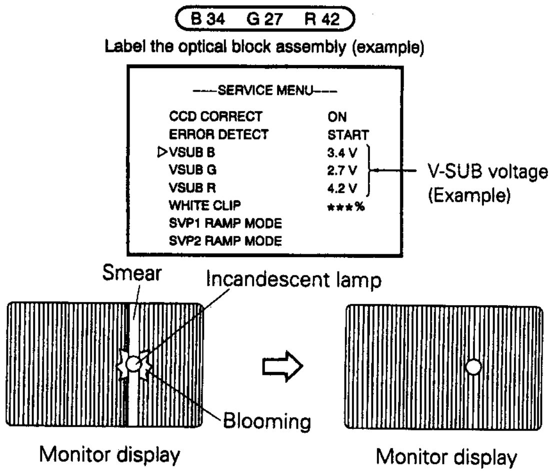
R-G :0
R-G :0
R GAIN LEVEL :* *
B GAIN LEVEL :* *
NAM ERROR :* *
GAIN *dB

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (①) Adjustment level (☆)	Adjustment procedure

2.8 CCD DRIVER ADJUSTMENT

The following adjustments are required only when the optical block assembly is replaced.

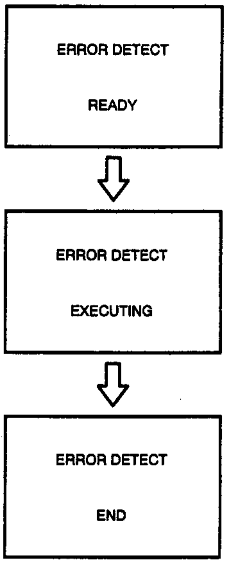
No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (①) Adjustment level (☆)	Adjustment procedure
1	V-SUB voltage adjustments	• Video monitor • 40W incandescent lamp	• SERVICE MENU ↓ "V SUB B" ↓ "V SUB G" ↓ "V SUB R"	◎ MONITOR OUTPUT terminal (75Ω terminated) ① VR5 [CP]	(1) Set S12-SW3 on the CP board to ON to initiate the service menu. (2) Place the cursor on "V SUB B" using the [ITEM] button. (3) While observing the monitor screen, adjust so that the V-SUB voltage of each channel becomes equal to the voltage value specified on the label of the optical block (tolerance ± 0.1 V). (4) Similarly, perform the "V SUB G" and "V SUB R" adjustments. (5) Take a shot of a 40 W incandescent lamp and make sure that here is no smear. (6) If there is any, fine-adjust the V-sub voltage at each channel until the smear disappears. (7) Set S12-SW3 to "OFF".


B 34 G 27 R 42
Label the optical block assembly (example)
---SERVICE MENU---
CCD CORRECT ON
ERROR DETECT START
▷VSUB B 3.4 V
VSUB G 2.7 V
VSUB R 4.2 V
WHITE CLIP ***%
SVP1 RAMP MODE
SVP2 RAMP MODE
V-SUB voltage (Example)
Smear
Incandescent lamp
Blooming
Monitor display
Monitor display

2.9 BLEMISH COMPENSATION

This camera incorporates a CCD blemish compensation function using an electronic memory. When the optical block assembly is replaced or in case a new blemish occurs, a renewed setting is required according to the following procedure. Note that the maximum number of compensated blemish is up to 13. (Compensated sequentially from the higher-level to the lower-lever blemishes).

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (①) Adjustment level (☆)	Adjustment procedure
1	Blemish compensation	• Video monitor	• SERVICE MENU ↓ "ERROR DETECT START"	◎ MONITOR OUTPUT connector (75Ω terminated)	**Before adjust blemish compensation, run the camera for more than 2 hours under an ambient temperature between +25 and +30°C.** (1) Set S12-SW3 on the CP board to ON to initiate the service menu. (2) Place the cursor on "ERROR DETECT START" using the [ITEM] button. (3) Press the [SET] button. (4) The monitor screen shows "ERROR DETECT READY" then "ERROR DETECT EXECUTING" and the blemish compensation starts. (5) When blemishes have been detected, the monitor shows "ERROR DETECT END" and the detected blemish data is compensated. (6) After completion of the blemish compensation, the monitor screen returns to the normal screen. (7) Set S12-SW3 to "OFF" and return the display to normal.


ERROR DETECT
READY
ERROR DETECT
EXECUTING
ERROR DETECT
END

SECTION 3
CHARTS AND DIAGRAMS

■ SCHEMATIC DIAGRAM NOTES

- **Schematic safety precaution**
  ⚠ Parts are safety related parts.
  When replacing them, be sure to use the specified parts.

- **Voltage and waveform measurements**

Voltage:	Measured with digital voltmeter in DC range; iris closed.
Waveform:	Gray scale illuminated at more than 4000 lux at 3200K lighting.

- **Unit of value**
  Unless otherwise specified

1) Resistance is in Ω (1/6 W)
2) Capacitance in μF
3) Inductance in μH

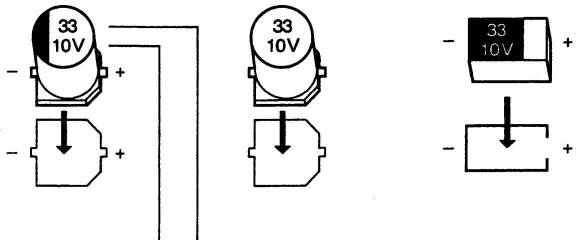
■ REPLACING SURFACE MOUNT "CHIP" COMPONENTS

- Some resistors, shorting jumpers (0 Ω resistance), ceramic capacitors, transistors, and diodes are chip parts. These chip parts cannot be reused after they are once removed.

- Chip resistors used in some circuits are of high precision type having little error in resistance.
  To demonstrate the full capacity of this set, place an order for proper parts referring to the diagrams and parts lists in the sections 5.

- Polarities of chip electrolytic capacitors and chip tantalum capacitors used in this model are as illustrated below.
  Polarities indicated by silk-screen printing on circuit boards are also shown below. When replacing such parts, make sure of polarities.

- Electrolytic capacitor
- Non-polarized electrolytic capacitor
- Tantalum capacitor

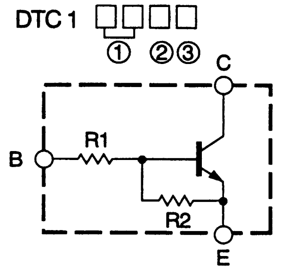


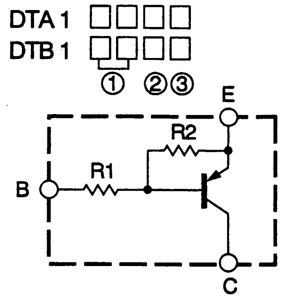
Capacitance (μF) Example: 33 μF

Dielectric strength (V) Example: 10 V

■ CHIP PARTS PIN ARRANGEMENT

[1] Digital transistors





① Two digits show resistance of R1 in abbreviation.

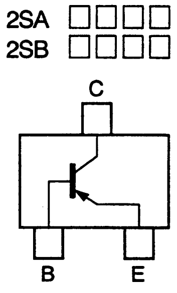
43 : 4.7 kΩ
14 : 10 kΩ
24 : 22 kΩ
44 : 47 kΩ

② Roman letter show the resistive ratio between R1 and R2 in abbreviation.

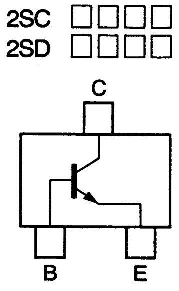
E : R2/R1 = 1/1
Y : R2/R1 = 5/1
W : R2/R1 = 2/1
X : R2/R1 = 1/2
T : R2 is opened.

③ Symbol the shape of resistor in abbreviation.

[2] Chip transistors



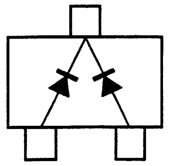
(Top view)



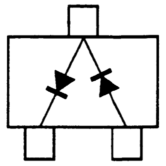
(Top view)

[3] Chip diodes

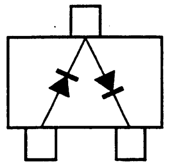
MA142WK



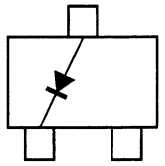
MA142WA



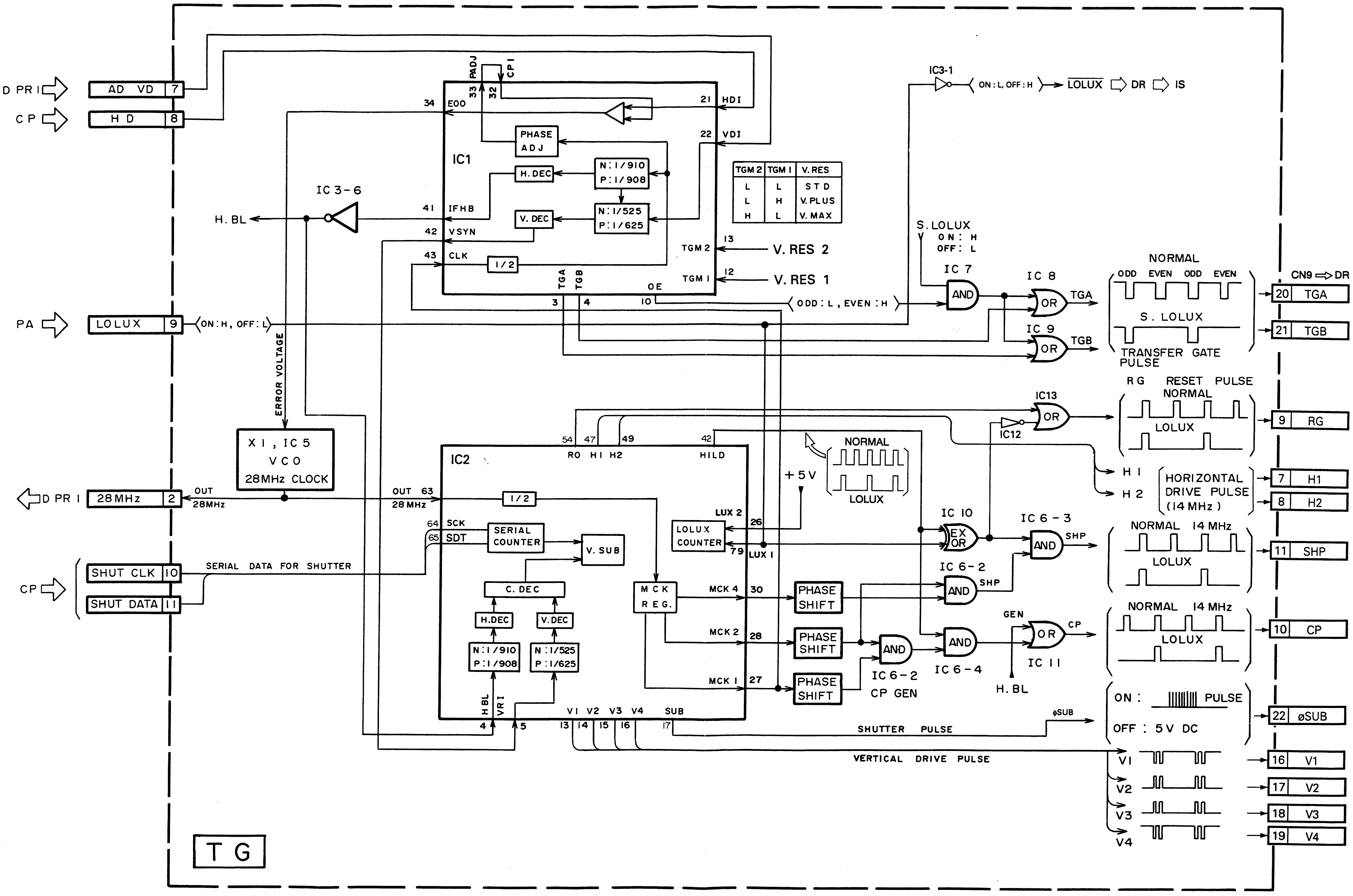
MA143A/MA742



MA142A

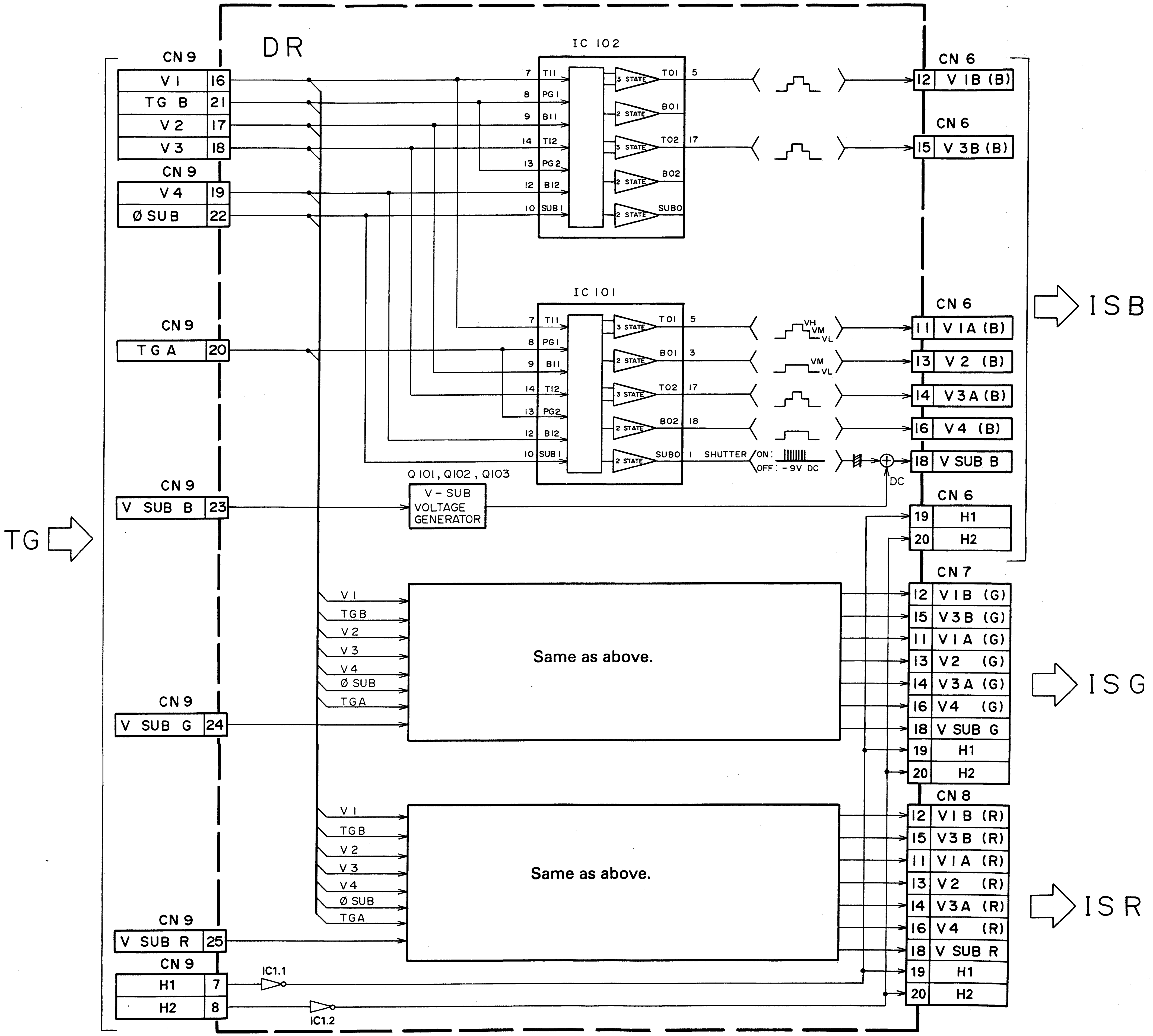


3.1 TG BOARD BLOCK DIAGRAM

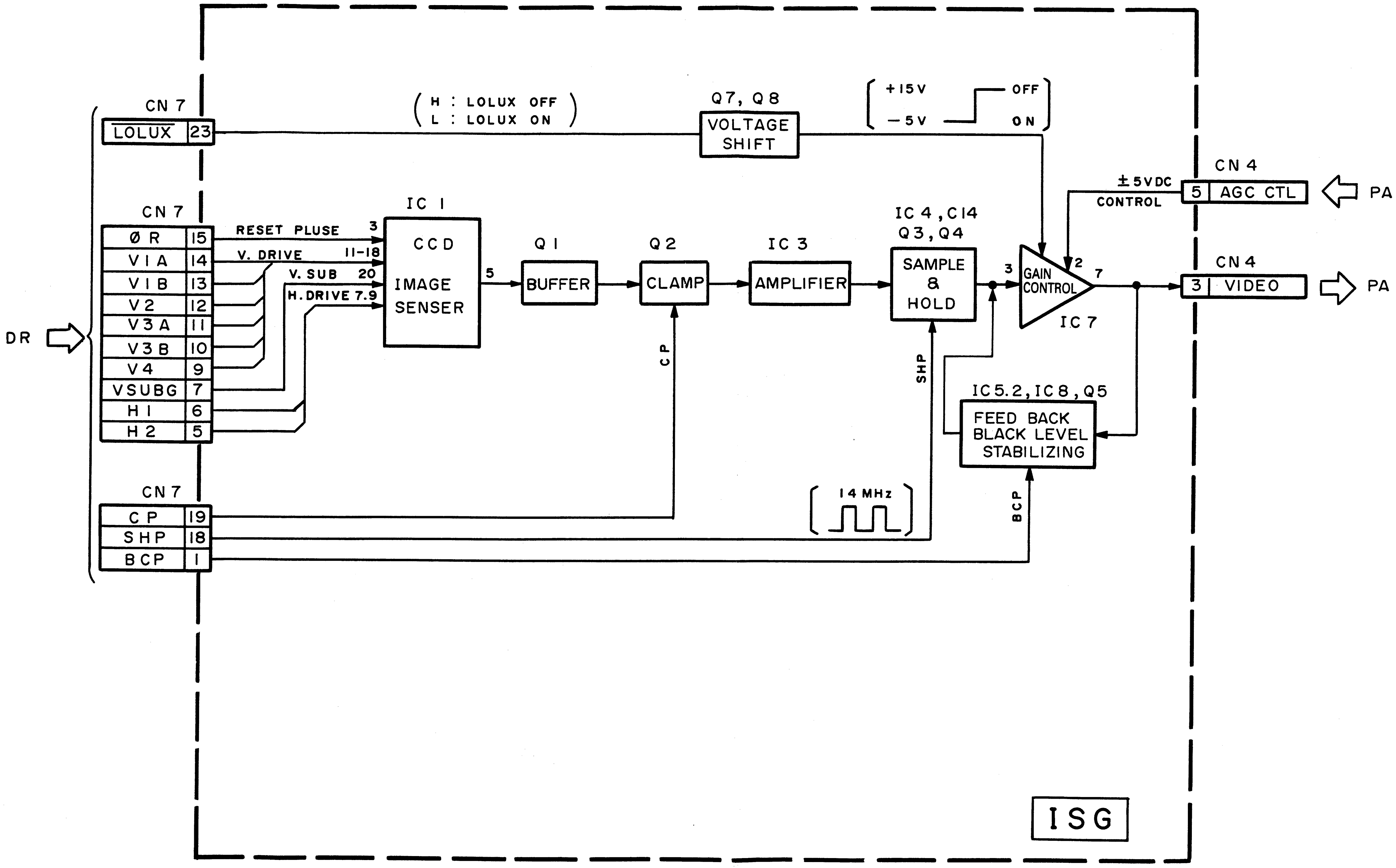

D PRI
CP
AD VD 7
H D 8
PA
LOLUX 9
ON:H, OFF:L
D PRI
28MHz 2
OUT
28MHz
CP
SHUT CLK 10
SHUT DATA 11
SERIAL DATA FOR SHUTTER
IC1
PADJ
CPI
33
32
34 EOO
21 HDI
22 VDI
PHASE ADJ
H. DEC
V. DEC
N:1/910
P:1/908
N:1/525
P:1/625
41 IFHB
42 VSYN
43 CLK
1/2
TGA
TGB
3
4
OE
10
TGM 2 13
TGM 1 12
V. RES 2
V. RES 1
IC 3-6
H. BL
ERROR VOLTAGE
X1, IC5
VCO
28MHz CLOCK
IC3-1
ON:L, OFF:H
LOLUX
DR
IS
S. LOLUX
ON: H
OFF: L
IC 7
AND
IC 8
OR
TGA
IC 9
OR
TGB
ODD:L, EVEN:H
NORMAL
ODD EVEN ODD EVEN
S. LOLUX
TRANSFER GATE PULSE
CN9 ⇨ DR
20 TGA
21 TGB
IC13
OR
IC12
RG RESET PULSE
NORMAL
LOLUX
9 RG
IC2
54 47 49 42
RO H1 H2 HILD
OUT 63
28MHz
1/2
64 SCK
65 SDT
SERIAL COUNTER
V. SUB
C. DEC
H.DEC
V.DEC
N:1/910
P:1/908
N:1/525
P:1/625
HBL
VRI
4
5
V1 V2 V3 V4 SUB
13 14 15 16 17
LOLUX COUNTER
LUX 2 26
79 LUX 1
MCK REG.
MCK 4 30
MCK 2 28
MCK 1 27
+5V
NORMAL
LOLUX
H1
H2
HORIZONTAL DRIVE PULSE (14MHz)
7 H1
8 H2
IC 10
EX OR
IC 6-3
AND
SHP
NORMAL 14MHz
LOLUX
11 SHP
PHASE SHIFT
PHASE SHIFT
PHASE SHIFT
IC 6-2
AND
SHP
AND
IC 6-2
CP GEN
AND
IC 6-4
GEN
OR
IC 11
CP
H. BL
NORMAL 14MHz
LOLUX
10 CP
φSUB
SHUTTER PULSE
ON: PULSE
OFF: 5V DC
22 øSUB
VERTICAL DRIVE PULSE
V1
V2
V3
V4
16 V1
17 V2
18 V3
19 V4
TG

TGM 2	TGM 1	V. RES
L	L	STD
L	H	V. PLUS
H	L	V. MAX

3.2 DR BOARD BLOCK DIAGRAM

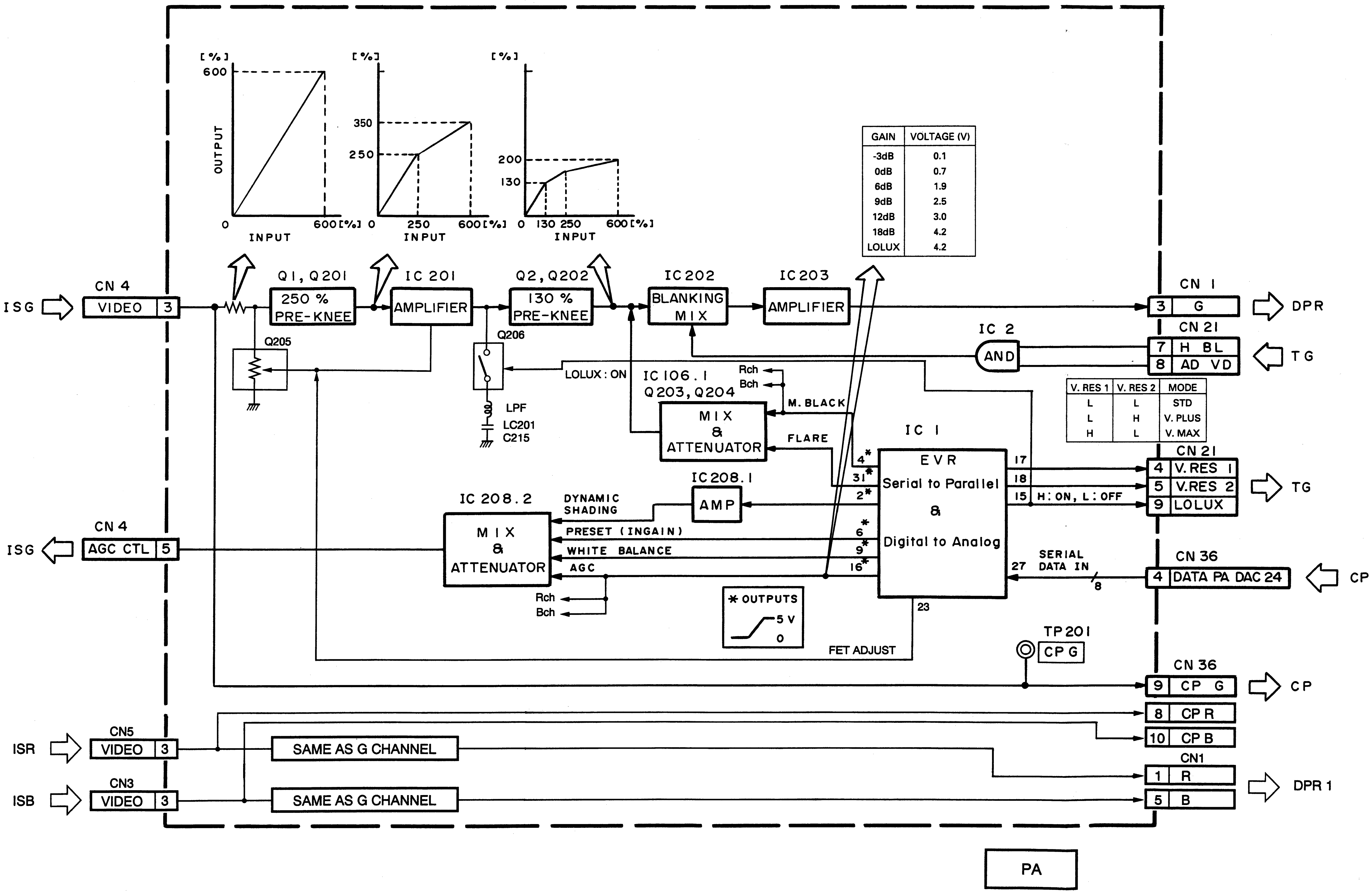

DR
IC 102
IC 101
CN 9
V 1 16
TG B 21
V 2 17
V 3 18
V 4 19
Ø SUB 22
TG A 20
V SUB B 23
V SUB G 24
V SUB R 25
H1 7
H2 8
IC1.1
IC1.2
TI1
PG1
BI1
TI2
PG2
BI2
SUB1
3 STATE
2 STATE
TO1
BO1
TO2
BO2
SUBO
VH
VM
VL
SHUTTER
ON:
OFF: -9V DC
DC
Q 101, Q102, Q103
V - SUB VOLTAGE GENERATOR
CN 6
12 V 1B (B)
15 V 3B (B)
11 V 1A (B)
13 V 2 (B)
14 V 3A (B)
16 V 4 (B)
18 V SUB B
19 H1
20 H2
CN 7
12 V 1B (G)
15 V 3B (G)
11 V 1A (G)
13 V 2 (G)
14 V 3A (G)
16 V 4 (G)
18 V SUB G
19 H1
20 H2
CN 8
12 V 1 B (R)
15 V 3B (R)
11 V 1A (R)
13 V 2 (R)
14 V 3A (R)
16 V 4 (R)
18 V SUB R
19 H1
20 H2
Same as above.
Same as above.
TG
ISB
ISG
ISR

3.3 IS BOARD BLOCK DIAGRAM



CN 7
LOLUX 23
H : LOLUX OFF
L : LOLUX ON
Q7, Q8
VOLTAGE SHIFT
+15V OFF
−5V ON
CN 7
ØR 15
V1A 14
V1B 13
V2 12
V3A 11
V3B 10
V4 9
VSUBG 7
H1 6
H2 5
DR
RESET PLUSE 3
V. DRIVE 11-18
V. SUB 20
H. DRIVE 7.9
IC 1
CCD IMAGE SENSER
5
Q1
BUFFER
Q2
CLAMP
CP
IC 3
AMPLIFIER
IC 4, C14
Q3, Q4
SAMPLE & HOLD
SHP
3
GAIN CONTROL
2
7
IC 7
±5VDC CONTROL
CN 4
5 AGC CTL
PA
CN 4
3 VIDEO
PA
IC5.2, IC8, Q5
FEED BACK BLACK LEVEL STABILIZING
BCP
14 MHz
CN 7
CP 19
SHP 18
BCP 1
ISG

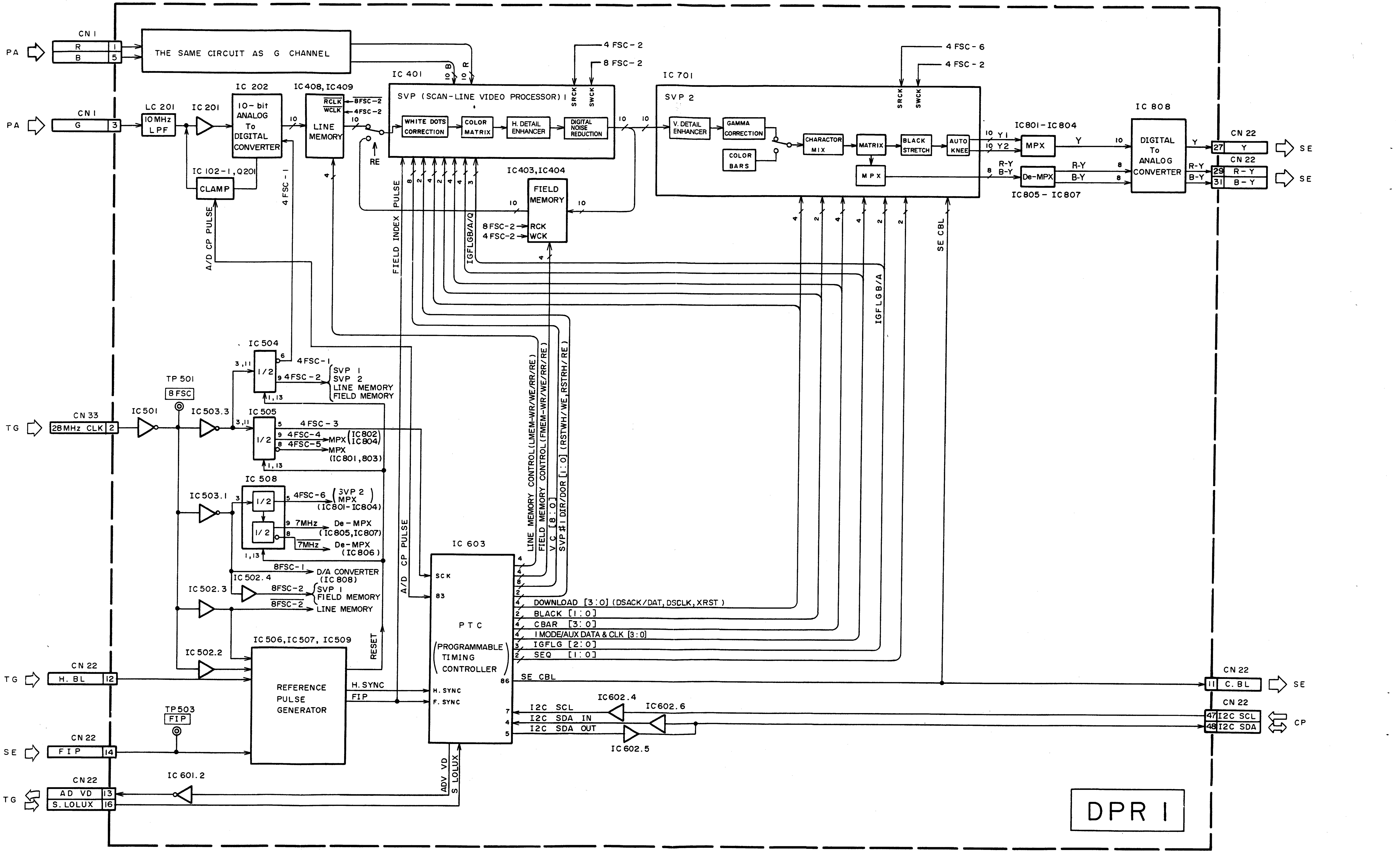
3.4 PA BOARD BLOCK DIAGRAM


[%]
600
OUTPUT
0
600[%]
INPUT
[%]
350
250
0
250
600[%]
INPUT
[%]
200
130
0
130 250
600[%]
INPUT
ISG
CN 4
VIDEO
3
Q1, Q201
250 %
PRE-KNEE
IC 201
AMPLIFIER
Q2, Q202
130 %
PRE-KNEE
IC202
BLANKING
MIX
IC203
AMPLIFIER
CN 1
3
G
DPR
Q205
Q206
LPF
LC201
C215
LOLUX : ON
IC 106.1
Q203, Q204
MIX
&
ATTENUATOR
Rch
Bch
M. BLACK
FLARE
IC 2
AND
CN 21
7
H BL
8
AD VD
TG
IC 1
EVR
Serial to Parallel
&
Digital to Analog
4*
31*
2*
6*
9*
16*
17
18
15
H : ON, L : OFF
27
SERIAL
DATA IN
8
23
CN 21
4
V.RES 1
5
V.RES 2
9
LOLUX
TG
IC208.1
AMP
IC 208.2
DYNAMIC
SHADING
PRESET (INGAIN)
WHITE BALANCE
AGC
MIX
&
ATTENUATOR
Rch
Bch
CN 4
ISG
AGC CTL
5
* OUTPUTS
5 V
0
FET ADJUST
CN 36
4
DATA PA DAC 24
CP
TP 201
CP G
CN 36
9
CP G
CP
8
CP R
10
CP B
CN5
ISR
VIDEO
3
SAME AS G CHANNEL
CN3
ISB
VIDEO
3
SAME AS G CHANNEL
CN1
1
R
5
B
DPR 1
PA

GAIN	VOLTAGE (V)
-3dB	0.1
0dB	0.7
6dB	1.9
9dB	2.5
12dB	3.0
18dB	4.2
LOLUX	4.2

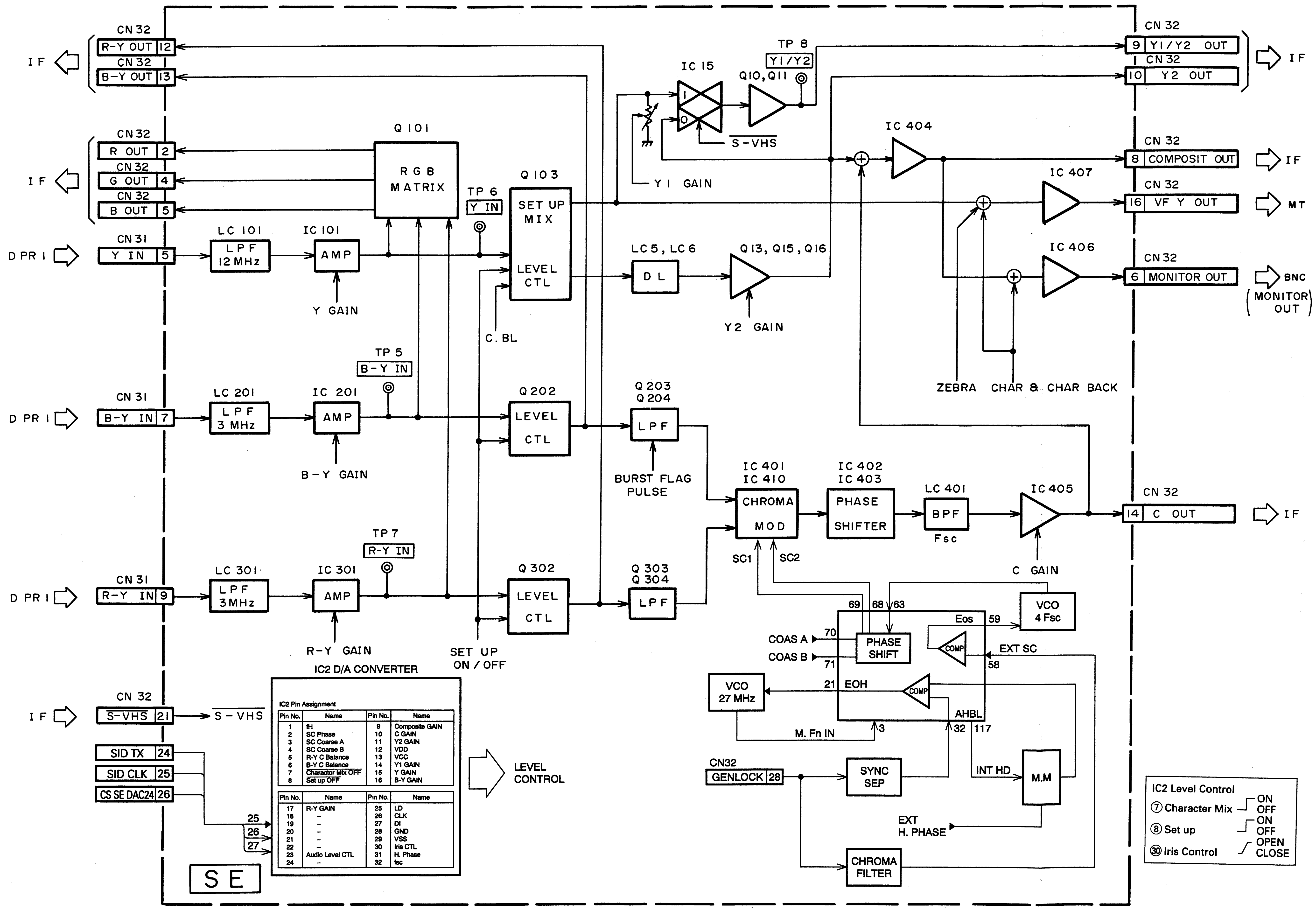
V. RES 1	V. RES 2	MODE
L	L	STD
L	H	V. PLUS
H	L	V. MAX

3.5 DPR1 CIRCUIT BOARD



PA
CN 1
R 1
B 5
THE SAME CIRCUIT AS G CHANNEL
PA
CN 1
G 3
LC 201
10 MHz LPF
IC 201
IC 202
10-bit ANALOG To DIGITAL CONVERTER
IC 102-1, Q201
CLAMP
A/D CP PULSE
IC408, IC409
RCLK
WCLK
8FSC-2
4FSC-2
LINE MEMORY
4 FSC-1
RE
IC 401
10 B
10 R
SVP (SCAN-LINE VIDEO PROCESSOR) 1
SRCK
SWCK
4 FSC-2
8 FSC-2
WHITE DOTS CORRECTION
COLOR MATRIX
H. DETAIL ENHANCER
DIGITAL NOISE REDUCTION
FIELD INDEX PULSE
IGFLGB/A/Q
IC403, IC404
FIELD MEMORY
8 FSC-2 RCK
4 FSC-2 WCK
IC 701
SVP 2
4 FSC-6
4 FSC-2
V. DETAIL ENHANCER
GAMMA CORRECTION
COLOR BARS
CHARACTOR MIX
MATRIX
BLACK STRETCH
AUTO KNEE
MPX
IGFLGB/A
SE CBL
IC801-IC804
Y1
Y2
MPX
Y
IC805-IC807
De-MPX
R-Y
B-Y
IC 808
DIGITAL To ANALOG CONVERTER
CN 22
27 Y
29 R-Y
31 B-Y
SE
SE
IC 504
1/2
4FSC-1
4FSC-2
SVP 1
SVP 2
LINE MEMORY
FIELD MEMORY
TP 501
8 FSC
TG
CN 33
28MHz CLK 2
IC501
IC 503.3
IC 505
4 FSC-3
4FSC-4
4FSC-5
MPX (IC802, IC804)
MPX (IC801, 803)
IC 508
IC 503.1
4FSC-6
(SVP 2 MPX (IC801-IC804))
7MHz De-MPX (IC805, IC807)
7MHz De-MPX (IC806)
8FSC-1
D/A CONVERTER (IC 808)
IC 502.4
IC 502.3
8FSC-2
SVP 1
FIELD MEMORY
8FSC-2
LINE MEMORY
IC 502.2
IC 506, IC 507, IC509
REFERENCE PULSE GENERATOR
RESET
H. SYNC
FIP
A/D CP PULSE
IC 603
SCK
83
PTC
(PROGRAMMABLE TIMING CONTROLLER)
H. SYNC
F. SYNC
LINE MEMORY CONTROL (LMEM-WR/WE/RR/RE)
FIELD MEMORY CONTROL (FMEM-WR/WE/RR/RE)
V C [8:0]
SVP #1 DIR/DOR [1:0] (RSTWH/WE, RSTRH/RE)
DOWNLOAD [3:0] (DSACK/DAT, DSCLK, XRST)
BLACK [1:0]
CBAR [3:0]
I MODE/AUX DATA & CLK [3:0]
IGFLG [2:0]
SEQ [1:0]
SE CBL
86
CN 22
11 C. BL
SE
IC602.4
IC602.6
I2C SCL
I2C SDA IN
I2C SDA OUT
IC 602.5
CN 22
47 I2C SCL
48 I2C SDA
CP
TG
CN 22
H. BL 12
TP503
FIP
SE
CN 22
FIP 14
TG
CN 22
AD VD 13
S. LOLUX 16
IC 601.2
ADV VD
S LOLUX
DPR 1

3.6 SE BOARD BLOCK DIAGRAM


IF
CN 32
R-Y OUT 12
CN 32
B-Y OUT 13
IF
CN 32
R OUT 2
CN 32
G OUT 4
CN 32
B OUT 5
D PR I
CN 31
Y IN 5
D PR I
CN 31
B-Y IN 7
D PR I
CN 31
R-Y IN 9
IF
CN 32
$\overline{\text{S-VHS}}$ 21
$\overline{\text{S-VHS}}$
SID TX 24
SID CLK 25
CS SE DAC24 26
25
26
27
SE
LC 101
LPF
12 MHz
IC 101
AMP
Y GAIN
Q 101
RGB
MATRIX
TP 6
Y IN
Q 103
SET UP
MIX
LEVEL
CTL
C. BL
LC 201
LPF
3 MHz
IC 201
AMP
B-Y GAIN
TP 5
B-Y IN
Q 202
LEVEL
CTL
LC 301
LPF
3 MHz
IC 301
AMP
R-Y GAIN
TP 7
R-Y IN
Q 302
LEVEL
CTL
SET UP
ON / OFF
IC2 D/A CONVERTER
LEVEL
CONTROL
IC 15
I
O
$\overline{\text{S-VHS}}$
Y I GAIN
TP 8
Y1/Y2
Q10, Q11
IC 404
IC 407
IC 406
LC5, LC6
D L
Q13, Q15, Q16
Y2 GAIN
ZEBRA
CHAR & CHAR BACK
Q 203
Q 204
LPF
BURST FLAG
PULSE
Q 303
Q 304
LPF
IC 401
IC 410
CHROMA
MOD
SC1
SC2
IC 402
IC 403
PHASE
SHIFTER
LC 401
BPF
Fsc
IC 405
C GAIN
69
68
63
VCO
4 Fsc
Eos
59
COAS A
70
COAS B
71
PHASE
SHIFT
COMP
EXT SC
58
VCO
27 MHz
21
EOH
COMP
AHBL
M. Fn IN
3
32
117
CN32
GENLOCK 28
SYNC
SEP
INT HD
M.M
EXT
H. PHASE
CHROMA
FILTER
CN 32
9 Y1/Y2 OUT
CN 32
10 Y2 OUT
IF
CN 32
8 COMPOSIT OUT
IF
CN 32
16 VF Y OUT
MT
CN 32
6 MONITOR OUT
BNC
(MONITOR OUT)
CN 32
14 C OUT
IF

IC2 Pin Assignment

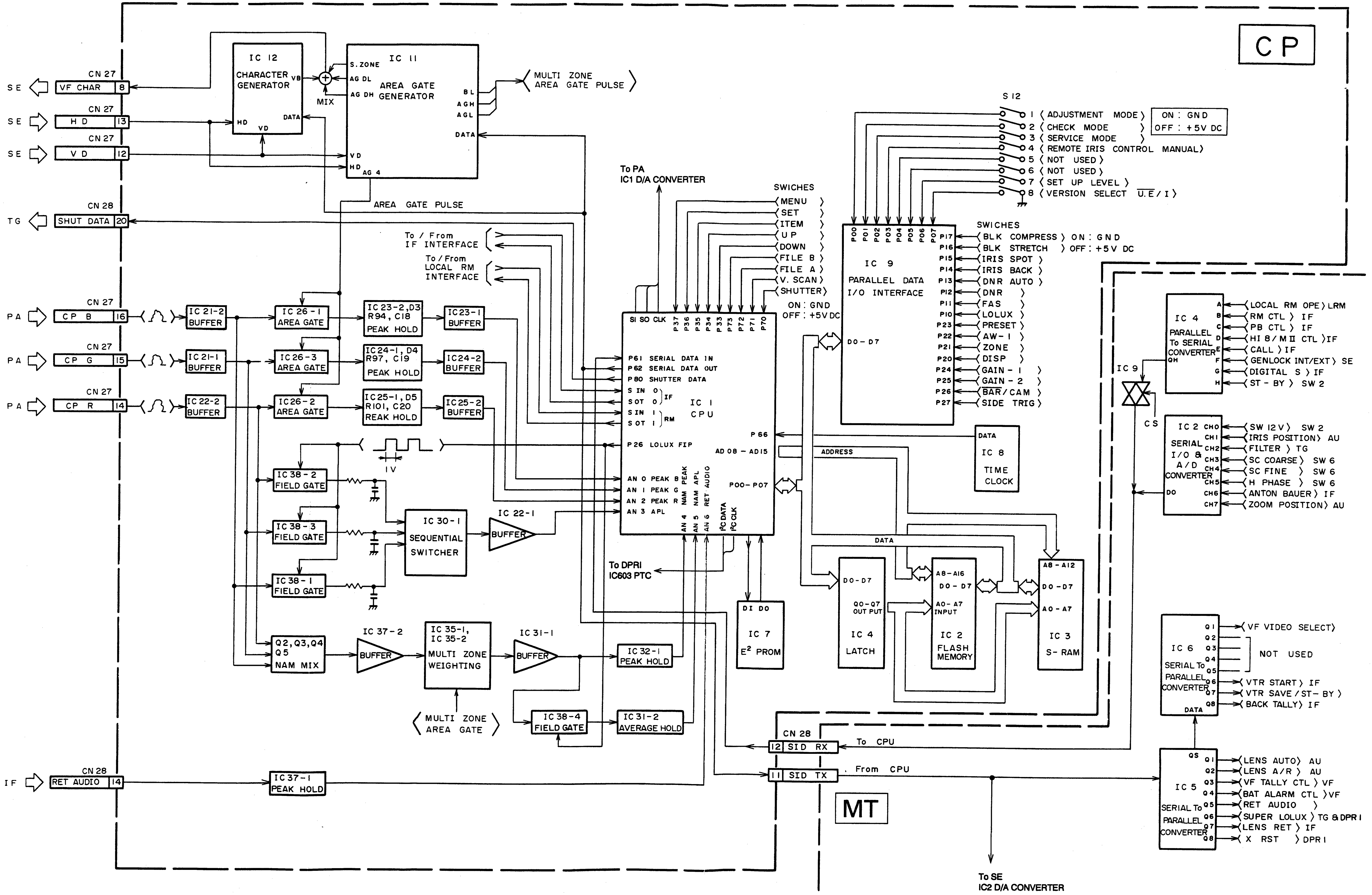
Pin No.	Name	Pin No.	Name
1	fH	9	Composite GAIN
2	SC Phase	10	C GAIN
3	SC Coarse A	11	Y2 GAIN
4	SC Coarse B	12	VDD
5	R-Y C Balance	13	VCC
6	B-Y C Balance	14	Y1 GAIN
7	$\overline{\text{Charactor Mix OFF}}$	15	Y GAIN
8	$\overline{\text{Set up OFF}}$	16	B-Y GAIN

Pin No.	Name	Pin No.	Name
17	R-Y GAIN	25	LD
18	–	26	CLK
19	–	27	DI
20	–	28	GND
21	–	29	VSS
22	–	30	Iris CTL
23	Audio Level CTL	31	H. Phase
24	–	32	fsc

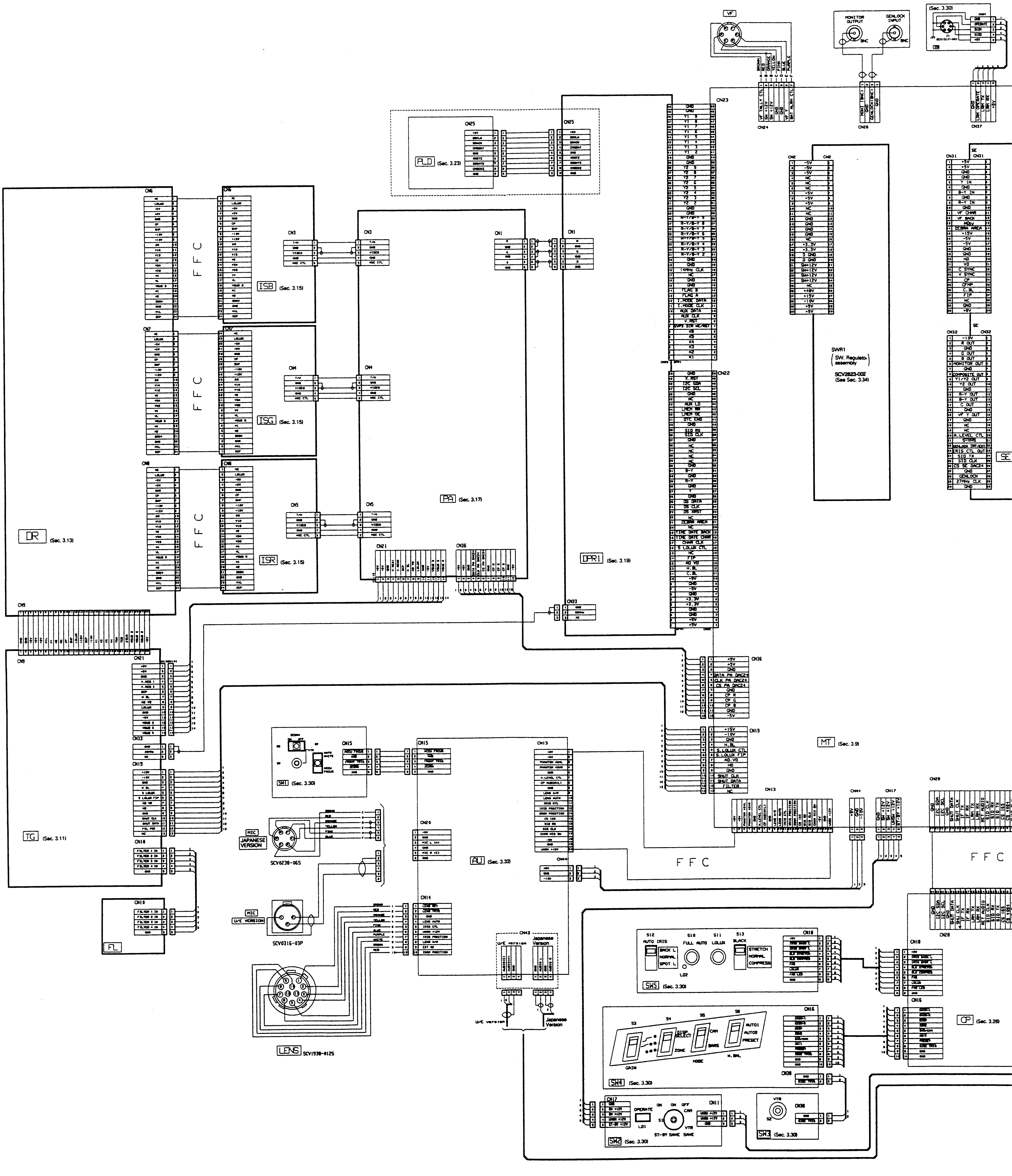
IC2 Level Control

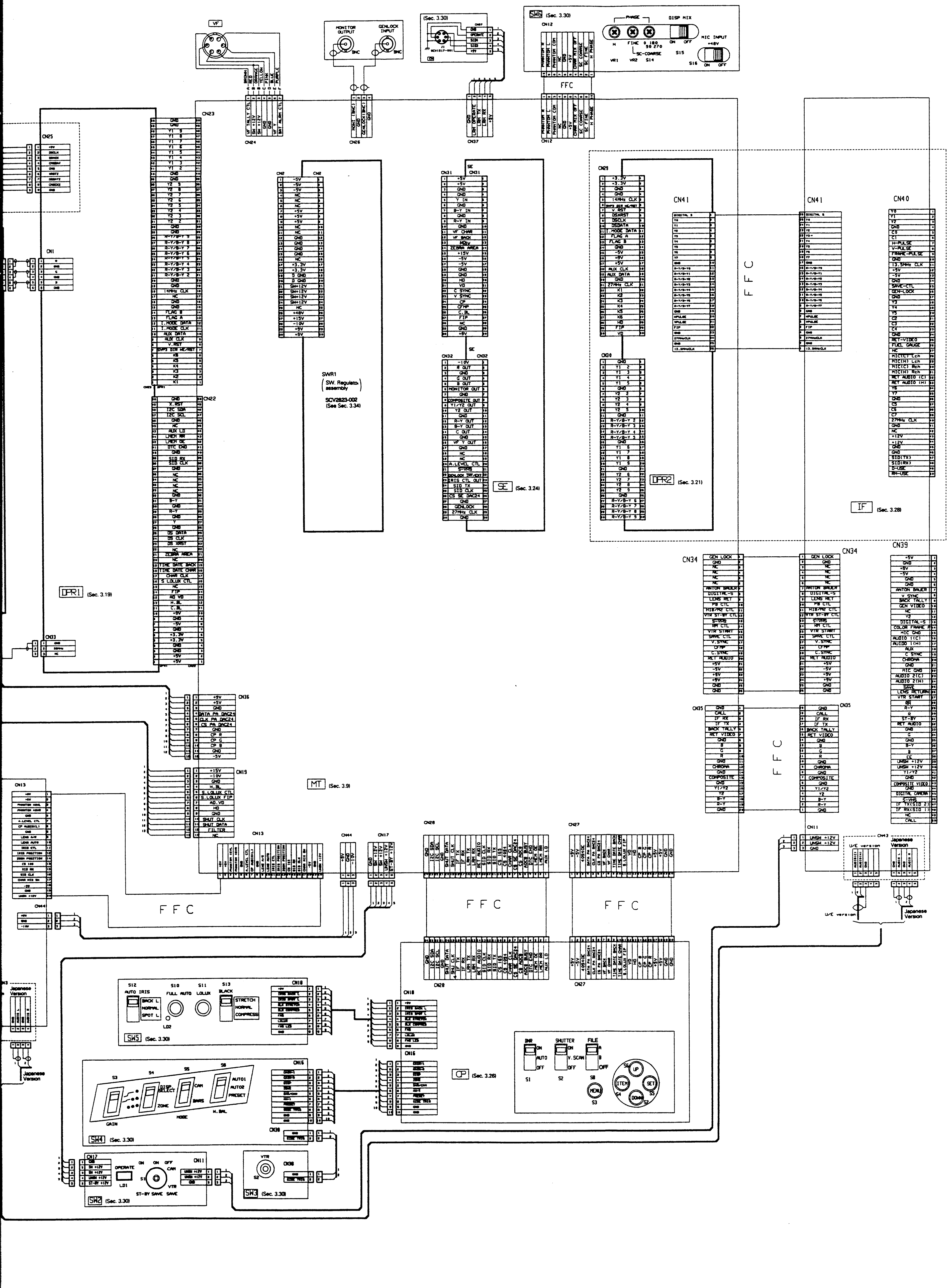
⑦ Character Mix ON / OFF
⑧ Set up ON / OFF
㉚ Iris Control OPEN / CLOSE

3.7 CP BOARD BLOCK DIAGRAM

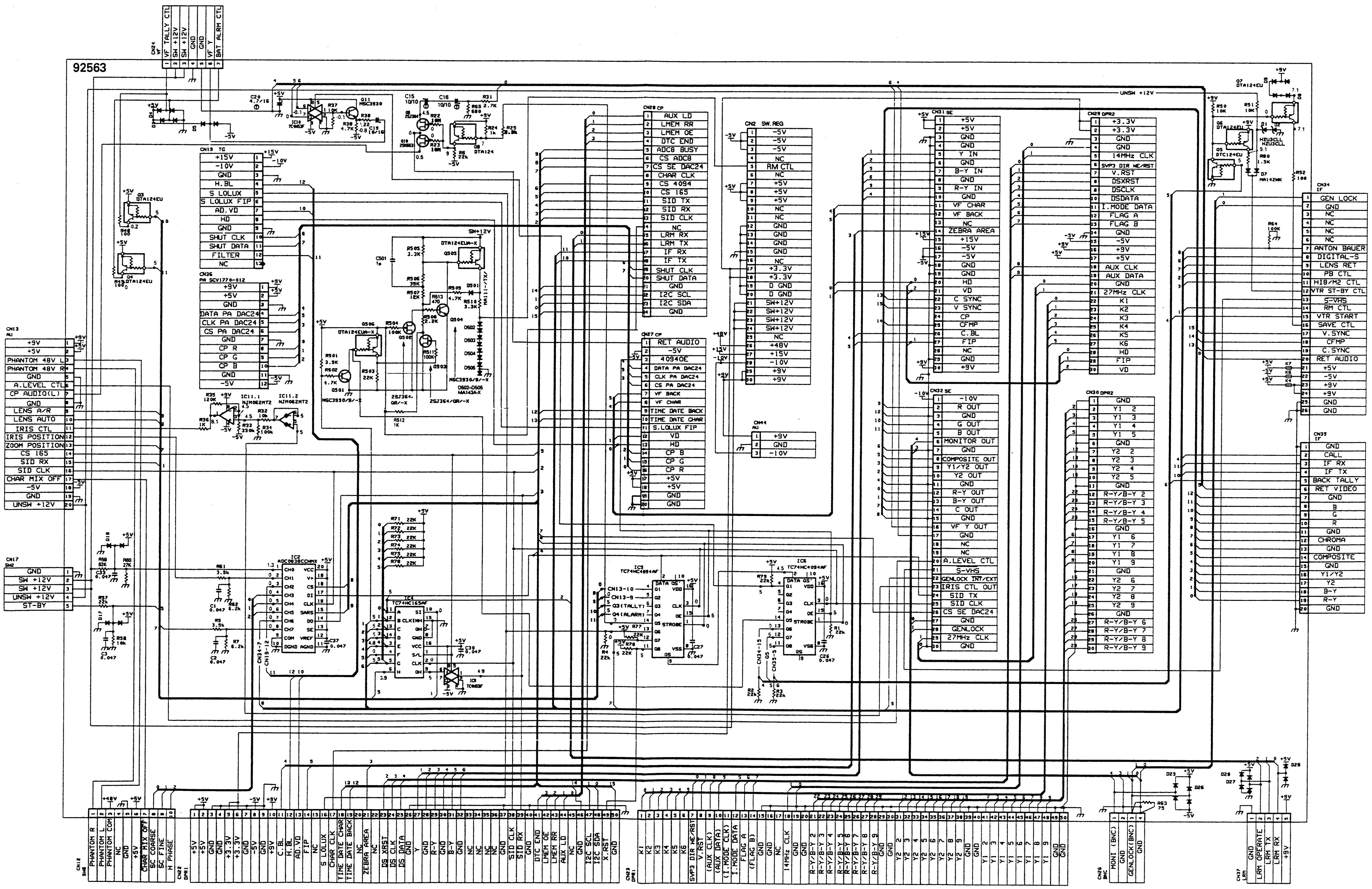

CP
MT
SE
CN 27
VF CHAR
8
HD
13
VD
12
TG
CN 28
SHUT DATA
20
PA
CP B
16
CP G
15
CP R
14
IF
RET AUDIO
IC 12
CHARACTER GENERATOR
VB
DATA
MIX
IC 11
S.ZONE
AG DL
AG DH
AREA GATE GENERATOR
BL
AGH
AGL
AG 4
MULTI ZONE AREA GATE PULSE
AREA GATE PULSE
IC 21-2 BUFFER
IC 21-1 BUFFER
IC 22-2 BUFFER
IC 26-1 AREA GATE
IC 26-3 AREA GATE
IC 26-2 AREA GATE
IC 23-2, D3 R94, C18 PEAK HOLD
IC 24-1, D4 R97, C19 PEAK HOLD
IC 25-1, D5 R101, C20 REAK HOLD
IC 23-1 BUFFER
IC 24-2 BUFFER
IC 25-2 BUFFER
1V
IC 38-2 FIELD GATE
IC 38-3 FIELD GATE
IC 38-1 FIELD GATE
IC 30-1 SEQUENTIAL SWITCHER
IC 22-1 BUFFER
Q2, Q3, Q4 Q5 NAM MIX
IC 37-2 BUFFER
IC 35-1, IC 35-2 MULTI ZONE WEIGHTING
IC 31-1 BUFFER
IC 32-1 PEAK HOLD
MULTI ZONE AREA GATE
IC 38-4 FIELD GATE
IC 31-2 AVERAGE HOLD
IC 37-1 PEAK HOLD
To / From IF INTERFACE
To / From LOCAL RM INTERFACE
To PA IC1 D/A CONVERTER
SWICHES
MENU
SET
ITEM
UP
DOWN
FILE B
FILE A
V. SCAN
SHUTTER
ON : GND
OFF : +5V DC
SI SO CLK
P37 P36 P35 P34 P33 P73 P72 P71 P70
P61 SERIAL DATA IN
P62 SERIAL DATA OUT
P80 SHUTTER DATA
S IN 0
SOT 0
IF
S IN 1
SOT 1
RM
IC 1 CPU
P66
P26 LOLUX FIP
AD 08 – AD15
AN 0 PEAK B
AN 1 PEAK G
AN 2 PEAK R
AN 3 APL
AN 4 NAM PEAK
AN 5 NAM APL
AN 6 RET AUDIO
I²C DATA
I²C CLK
P00 – P07
To DPRI IC603 PTC
DI DO
IC 7 E² PROM
S 12
1 (ADJUSTMENT MODE)
2 (CHECK MODE)
3 (SERVICE MODE)
4 (REMOTE IRIS CONTROL MANUAL)
5 (NOT USED)
6 (NOT USED)
7 (SET UP LEVEL)
8 (VERSION SELECT U.E / I)
ON : GND
OFF : +5V DC
P00 P01 P02 P03 P04 P05 P06 P07
IC 9 PARALLEL DATA I/O INTERFACE
D0 – D7
SWICHES
P17 (BLK COMPRESS) ON : GND
P16 (BLK STRETCH) OFF : +5V DC
P15 (IRIS SPOT)
P14 (IRIS BACK)
P13 (DNR AUTO)
P12 (DNR)
P11 (FAS)
P10 (LOLUX)
P23 (PRESET)
P22 (AW - I)
P21 (ZONE)
P20 (DISP)
P24 (GAIN - 1)
P25 (GAIN - 2)
P26 (BAR / CAM)
P27 (SIDE TRIG)
DATA
IC 8 TIME CLOCK
ADDRESS
DATA
D0 – D7
Q0 – Q7 OUT PUT
IC 4 LATCH
A8 – A16
D0 – D7
A0 – A7 INPUT
IC 2 FLASH MEMORY
A8 – A12
D0 – D7
A0 – A7
IC 3 S-RAM
IC 9
CS
IC 4 PARALLEL To SERIAL CONVERTER
QH
A (LOCAL RM OPE) LRM
B (RM CTL) IF
C (PB CTL) IF
D (HI 8 / M II CTL) IF
E (CALL) IF
F (GENLOCK INT/EXT) SE
G (DIGITAL S) IF
H (ST - BY) SW 2
IC 2 SERIAL I/O & A/D CONVERTER
DO
CH0 (SW 12V) SW 2
CH1 (IRIS POSITION) AU
CH2 (FILTER) TG
CH3 (SC COARSE) SW 6
CH4 (SC FINE) SW 6
CH5 (H PHASE) SW 6
CH6 (ANTON BAUER) IF
CH7 (ZOOM POSITION) AU
IC 6 SERIAL To PARALLEL CONVERTER
DATA
Q1 (VF VIDEO SELECT)
Q2 Q3 Q4 Q5 NOT USED
Q6 (VTR START) IF
Q7 (VTR SAVE / ST - BY)
Q8 (BACK TALLY) IF
CN 28
12 SID RX
To CPU
11 SID TX
From CPU
IC 5 SERIAL To PARALLEL CONVERTER
QS
Q1 (LENS AUTO) AU
Q2 (LENS A/R) AU
Q3 (VF TALLY CTL) VF
Q4 (BAT ALARM CTL) VF
Q5 (RET AUDIO)
Q6 (SUPER LOLUX) TG & DPRI
Q7 (LENS RET) IF
Q8 (X RST) DPRI
To SE IC2 D/A CONVERTER

3.8 OVERALL WIRING DIAGRAM

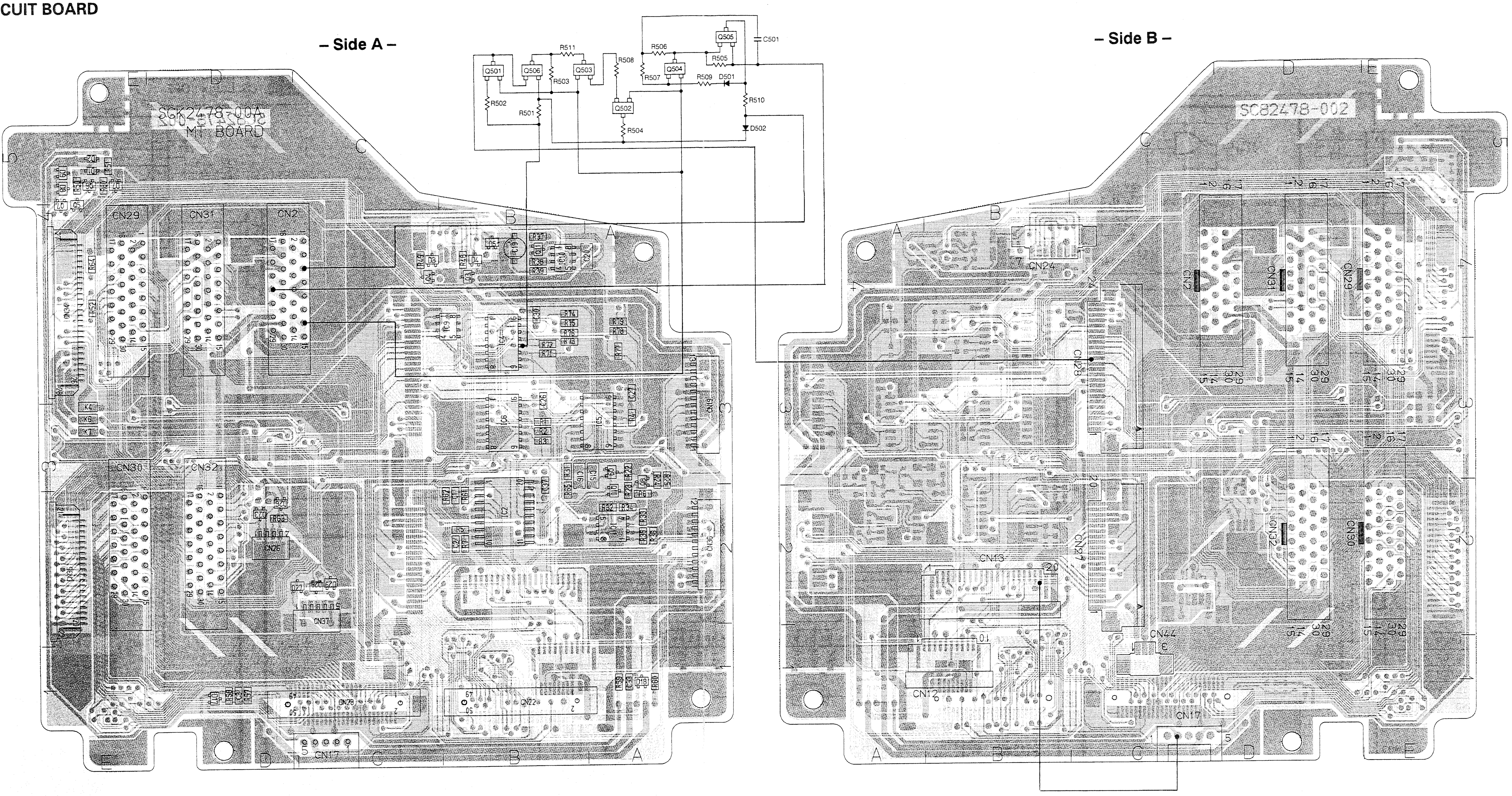

VF
MONITOR OUTPUT
GENLOCK INPUT
(Sec. 3.30)
PLD (Sec. 3.23)
DR (Sec. 3.13)
ISB (Sec. 3.15)
ISG (Sec. 3.15)
ISR (Sec. 3.15)
PA (Sec. 3.17)
DPR1 (Sec. 3.19)
SWR1
(SW. Regulator assembly)
SCV2823-002
(See Sec. 3.34)
SE
MT (Sec. 3.9)
TG (Sec. 3.11)
FL
SW1 (Sec. 3.30)
MIC
JAPANESE VERSION
SCV0238-06S
MIC
U/E VERSION
SCV0316-03P
LENS SCV1938-012S
AU (Sec. 3.32)
U/E version
Japanese Version
SW5 (Sec. 3.30)
SW4 (Sec. 3.30)
SW2 (Sec. 3.30)
SW3 (Sec. 3.30)
OP (Sec. 3.26)
F F C
CN23
CN22
CN24
CN26
CN37
CN31
CN32
CN36
CN19
CN13
CN44
CN17
CN28
CN18
CN16
CN38
CN11
CN15
CN20
CN14
CN43
CN21
CN33
CN10
CN25
CN3
CN4
CN5
CN1
CN2
CN6
CN7
CN8
AUTO IRIS
BACK L
NORMAL
SPOT L
FULL AUTO
LOLUX
BLACK
STRETCH
NORMAL
COMPRESS
GAIN
DISP SELECT
ZONE
CAM
BARS
MODE
AUTO1
AUTO2
PRESET
H. BAL
OPERATE
ON
OFF
VTR
ST-BY SAVE
SAVE
LD1
LD2


VF
MONITOR OUTPUT
GENLOCK INPUT
BNC
(Sec. 3.30)
SW6 (Sec. 3.30)
CN12
PHASE
DISP MIX
H
FINE
0 180
90 270
SC-COARSE
ON OFF
MIC INPUT
+48V
VR1
VR2
S14
S15
S16
ON OFF
FFC
CN23
CN24
CN26
CN37
CN12
CN25
CN1
CN22
CN33
DPR1 (Sec. 3.19)
CN2
SWR1
SW. Regulator assembly
SCV2823-002
(See Sec. 3.34)
SE
CN31
CN32
SE (Sec. 3.24)
CN29
CN30
CN41
CN40
DPR2 (Sec. 3.21)
FFC
IF (Sec. 3.28)
CN34
CN39
CN35
CN36
CN19
MT (Sec. 3.9)
CN13
CN44
CN17
CN11
CN43
U/E version
Japanese Version
CN28
CN27
FFC
FFC
FFC
CN18
CN16
S12 AUTO IRIS
BACK L
NORMAL
SPOT L
S10 FULL AUTO
S11 LOLUX
S13 BLACK
STRETCH
NORMAL
COMPRESS
LD2
SW5 (Sec. 3.30)
CP (Sec. 3.26)
BMR
ON
AUTO
OFF
SHUTTER
ON
V.SCAN
OFF
FILE
A
B
OFF
S1
S2
S8
MENU
S3
UP
ITEM
SET
DOWN
S4
S5
S6
S7
S3
S4
S5
S6
DISP SELECT
CAM
BARS
ZONE
MODE
GAIN
AUTO1
AUTO2
PRESET
H. BAL
SW4 (Sec. 3.30)
CN38
CN17
OPERATE
LD1
ON
ON OFF
CAM
S1
VTR
ST-BY SAVE SAVE
CN11
SW2 (Sec. 3.30)
VTR
S2
CN38
SW3 (Sec. 3.30)
Japanese Version

3.9 MT BOARD SCHEMATIC DIAGRAM 01

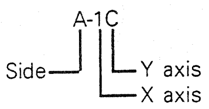

92563
CN24 VF
VF TALLY CTL
SW +12V
SW +12V
GND
GND
VF Y
BAT ALRM CTL
CN13 AU
+9V
+5V
PHANTOM 48V L
PHANTOM 48V R
GND
A.LEVEL CTL
CP AUDIO(L)
GND
LENS A/R
LENS AUTO
IRIS CTL
IRIS POSITION
ZOOM POSITION
CS 165
SID RX
SID CLK
CHAR MIX OFF
-5V
GND
UNSW +12V
CN17 SHE
GND
SW +12V
SW +12V
UNSW +12V
ST-BY
CN15 TG
+15V
-10V
GND
H.BL
S LOLUX
S LOLUX FIP
AD.VD
HD
GND
SHUT CLK
SHUT DATA
FILTER
NC
CN36 PA SCV1770-012
+9V
+5V
GND
DATA PA DAC24
CLK PA DAC24
CS PA DAC24
GND
CP R
CP G
CP B
GND
-5V
CN28 CP
AUX LD
LMEM RR
LMEM OE
DTC END
ADC8 BUSY
CS ADC8
CS SE DAC24
CHAR CLK
CS 4094
CS 165
SID TX
SID RX
SID CLK
NC
LRM RX
LRM TX
IF RX
IF TX
SHUT CLK
SHUT DATA
GND
I2C SCL
I2C SDA
GND
CN27 CP
RET AUDIO
-5V
4094OE
DATA PA DAC24
CLK PA DAC24
CS PA DAC24
VF BACK
VF CHAR
TIME DATE BACK
TIME DATE CHAR
S.LOLUX FIP
VD
HD
CP B
CP G
CP R
+5V
+5V
GND
GND
CN2 SW.REG
-5V
-5V
-5V
NC
RM CTL
NC
+5V
+5V
+5V
NC
NC
GND
GND
GND
GND
NC
+3.3V
+3.3V
D GND
D GND
SW+12V
SW+12V
SW+12V
SW+12V
NC
+48V
+15V
-10V
+9V
+9V
CN44 AU
+9V
GND
-10V
CN31 SE
+5V
+5V
GND
GND
Y IN
GND
B-Y IN
GND
R-Y IN
GND
VF CHAR
VF BACK
NC
ZEBRA AREA
+15V
-5V
-5V
GND
GND
HD
VD
C SYNC
V SYNC
CP
CFMP
C.BL
FIP
NC
GND
+9V
CN32 SE
-10V
R OUT
GND
G OUT
B OUT
MONITOR OUT
GND
COMPOSITE OUT
Y1/Y2 OUT
Y2 OUT
GND
R-Y OUT
B-Y OUT
C OUT
GND
VF Y OUT
GND
NC
NC
A.LEVEL CTL
S-VHS
GENLOCK INT/EXT
IRIS CTL OUT
SID TX
SID CLK
CS SE DAC24
GND
GENLOCK
27MHz CLK
GND
CN29 DPR2
+3.3V
+3.3V
GND
GND
14MHz CLK
SVP3 DIR WE/RST
V.RST
DSXRST
DSCLK
DSDATA
I.MODE DATA
FLAG A
FLAG B
GND
-5V
+9V
+9V
AUX CLK
AUX DATA
GND
27MHz CLK
K1
K2
K3
K4
K5
K6
HD
FIP
VD
CN30 DPR2
GND
Y1 2
Y1 3
Y1 4
Y1 5
GND
Y2 2
Y2 3
Y2 4
Y2 5
GND
R-Y/B-Y 2
R-Y/B-Y 3
R-Y/B-Y 4
R-Y/B-Y 5
GND
Y1 6
Y1 7
Y1 8
Y1 9
GND
Y2 6
Y2 7
Y2 8
Y2 9
GND
R-Y/B-Y 6
R-Y/B-Y 7
R-Y/B-Y 8
R-Y/B-Y 9
CN34 IF
GEN LOCK
GND
NC
NC
NC
NC
ANTON BAUER
DIGITAL-S
LENS RET
PB CTL
HI8/M2 CTL
VTR ST-BY CTL
S-VHS
RM CTL
VTR START
SAVE CTL
V.SYNC
CFMP
C.SYNC
RET AUDIO
+5V
-5V
+9V
+9V
GND
GND
CN35 IF
GND
CALL
IF RX
IF TX
BACK TALLY
RET VIDEO
GND
B
G
R
GND
CHROMA
GND
COMPOSITE
GND
Y1/Y2
Y2
B-Y
R-Y
GND
CN12 SHE
PHANTOM R
PHANTOM L
PHANTOM COM
NC
GND
+5V
CHAR MIX OFF
SC COARSE
SC FINE
H PHASE
CN22 DPR1
+5V
+5V
GND
GND
+3.3V
+3.3V
-5V
-5V
GND
+9V
C.BL
H.BL
AD.VD
FIP
NC
S LOLUX
CHAR CLK
TIME DATE CHAR
TIME DATE BACK
NC
ZEBRA AREA
NC
DS XRST
DS CLK
DS DATA
R-Y
GND
G-Y
GND
B-Y
GND
NC
NC
NC
NC
GND
SID CLK
SID RX
GND
DTC END
LMEM OE
LMEM RR
AUX LD
NC
I2C SCL
I2C SDA
X.RST
GND
CN23 DPR1
K1
K2
K3
K4
K5
K6
SVP3 DIR WE/RST
V.RST
(AUX CLK)
(AUX DATA)
I.MODE DATA
FLAG A
(FLAG B)
GND
NC
14MHz CLK
GND
GND
R-Y/B-Y 2
R-Y/B-Y 3
R-Y/B-Y 4
R-Y/B-Y 5
R-Y/B-Y 6
R-Y/B-Y 7
R-Y/B-Y 8
R-Y/B-Y 9
GND
Y2 2
Y2 3
Y2 4
Y2 5
Y2 6
Y2 7
Y2 8
Y2 9
GND
Y1 2
Y1 3
Y1 4
Y1 5
Y1 6
Y1 7
Y1 8
Y1 9
GND
GND
CN26 BNC
MONI (BNC)
GND
GENLOCK(BNC)
GND
CN37 LRM
GND
LRM OPERATE
LRM TX
LRM RX
+9V
IC2 ADC0838CCWMX
IC4 TC74HC165AF
IC3 TC74HC4094AF
IC5 TC74HC4094AF
IC1 TC4S3F
IC10 TC4S3F
IC11.1 NJM062NT2
IC11.2 NJM062NT2
Q11 MSC3930
Q3 DTA124EU
Q4 DTA124EU
Q5 DTC124EU
Q6 DTA124EU
Q7 DTA124EU
Q503 DTA124EUA-X
Q506 DTA124EUA-X
Q501 MSC3930/B/-X
2SJ364/GR/-X
D502-D505 MA143A-X
MA111-/TX/
UNSW +12V
+5V
-5V
+9V
+12V
+48V

3.10 MT CIRCUIT BOARD


– Side A –
– Side B –
Q501
Q506
Q503
Q505
Q504
Q502
R501
R502
R503
R504
R505
R506
R507
R508
R509
R510
R511
D501
D502
C501
SCK2478-00A
MT BOARD
SC82478-002
CN2
CN12
CN13
CN17
CN19
CN22
CN24
CN26
CN27
CN28
CN29
CN30
CN31
CN32
CN37
CN44
IC2
K4
K6
K7
A
B
C
D
E
1
2
3
4
5

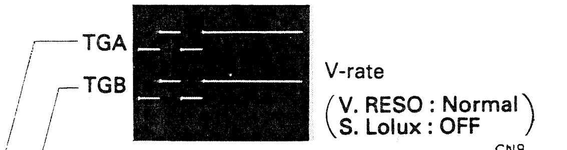
●ADDRESS TABLE OF BOARD PARTS

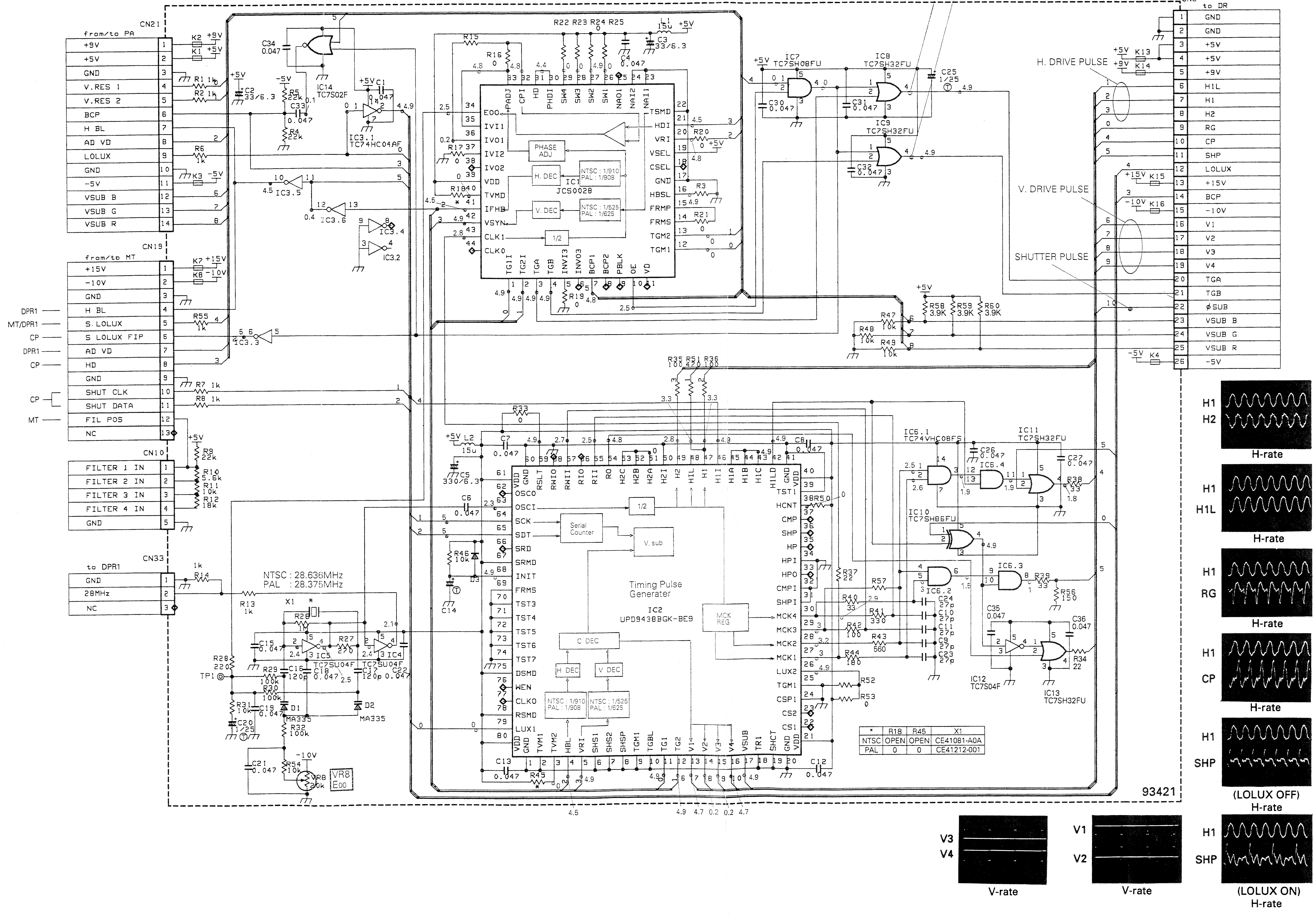
Each address may have an address error by one interval.


A-1C
Side
Y axis
X axis

IC2	A- 3B
IC4	A- 4B
IC5	A- 3A
IC6	A- 3B
IC9	A- 4B
IC10	A- 4B
IC11	A- 2A
Q3	A- 4B
Q4	A- 4B
Q5	A- 5E
Q6	A- 5E
Q7	A- 5E
Q8	A- 3A
Q9	A- 3A
Q10	A- 2A
Q11	A- 4B
D1	A- 5E
D2	A- 5E
D3	A- 4B
D4	A- 4B
D5	A- 4B
D7	A- 5E
D8	A- 5E
D9	A- 5E
D17	A- 1D
D18	A- 1A
D23	A- 2D
D26	A- 2D
D27	A- 2C
D28	A- 2C
D29	A- 2C
R1	A- 3B
R2	A- 3B
R3	A- 3B
R4	A- 3A
R5	A- 2B
R6	A- 2A
R7	A- 2B
R22	A- 3A
R23	A- 2A
R24	A- 3A
R25	A- 3A
R31	A- 3B
R32	A- 2A
R33	A- 2A
R34	A- 2A
R35	A- 2A
R36	A- 2A
R37	A- 4B
R38	A- 4B
R39	A- 4B
R48	A- 4B
R49	A- 4C
R50	A- 5E
R51	A- 5E
R52	A- 4E
R57	A- 1D
R58	A- 1D
R59	A- 1A
R60	A- 1A
R61	A- 2B
R62	A- 2B
R63	A- 2D
R64	A- 4E
R65	A- 2B
R71	A- 3B
R72	A- 4B
R73	A- 4B
R74	A- 4B
R75	A- 4B
R76	A- 4B
R77	A- 3A
R78	A- 4A
R79	A- 4A
R80	A- 5E
C1	A- 2B
C2	A- 2B
C3	A- 1D
C15	A- 3A
C16	A- 3A
C19	A- 4B
C20	A- 4A
C26	A- 3B
C27	A- 3A
C30	A- 4B
C33	A- 1A
C37	A- 3B
CN2	A- 4C
CN12	B- 1B
CN13	B- 2B
CN17	A- 1C
CN19	A- 3A
CN22	A- 1B
CN23	A- 1C
CN24	B- 4B
CN26	A- 2D
CN27	B- 2C
CN28	B- 3C
CN29	A- 4E
CN30	A- 2E
CN31	A- 4D
CN32	A- 2D
CN34	A- 4E
CN35	A- 2E
CN36	A- 2A
CN37	A- 2C
CN44	B- 1C
K4	A- 3E
K6	A- 3E
K7	A- 3E

3.11 TG BOARD SCHEMATIC DIAGRAM 02

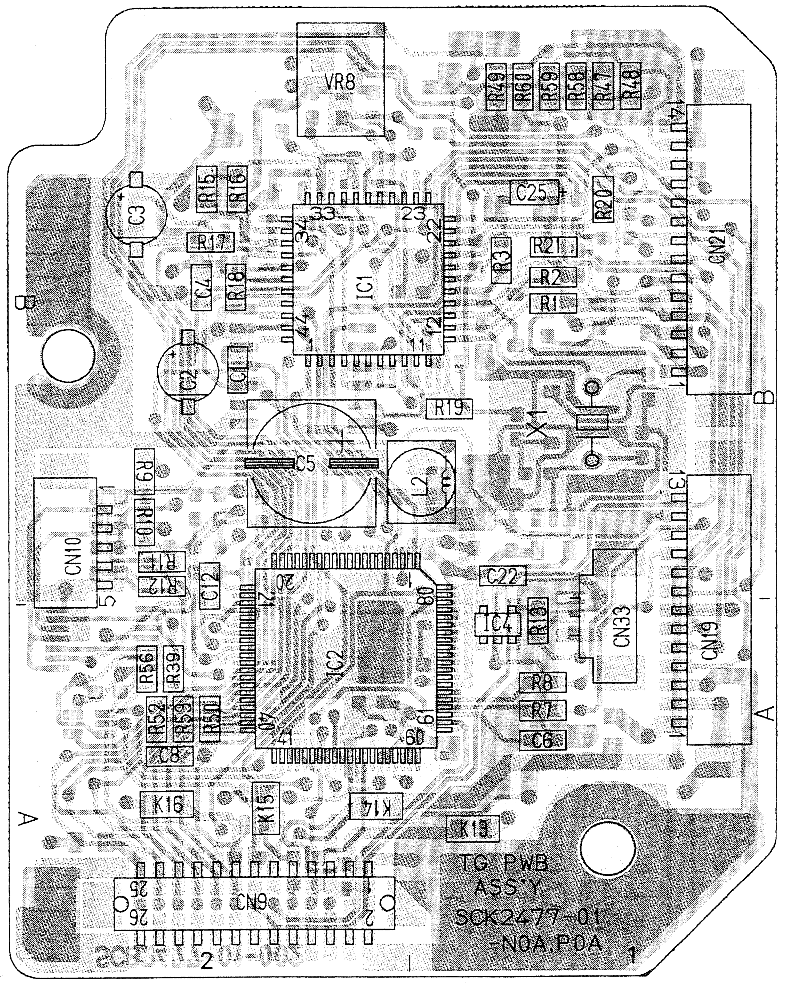



CN21
from/to PA
+9V
+5V
GND
V.RES 1
V.RES 2
BCP
H BL
AD VD
LOLUX
GND
-5V
VSUB B
VSUB G
VSUB R
CN19
from/to MT
+15V
-10V
GND
H BL
S. LOLUX
S LOLUX FIP
AD VD
HD
GND
SHUT CLK
SHUT DATA
FIL POS
NC
DPR1
MT/DPR1
CP
DPR1
CP
CP
MT
CN10
FILTER 1 IN
FILTER 2 IN
FILTER 3 IN
FILTER 4 IN
GND
CN33
to DPR1
GND
28MHz
NC
NTSC : 28.636MHz
PAL : 28.375MHz
IC14 TC7S02F
IC3.1 TC74HC04AF
IC3.5
IC3.6
IC3.4
IC3.2
IC3.3
IC1 JCS0028
PHASE ADJ
H. DEC
V. DEC
NTSC : 1/910 PAL : 1/908
NTSC : 1/525 PAL : 1/625
1/2
IC5 TC7SU04F
IC4 TC7SU04F
D1 MA335
D2 MA335
TP1
VR8 E00
IC2 UPD9438BGK-BE9
Timing Pulse Generater
Serial Counter
V. sub
MCK REG
C DEC
H DEC
V DEC
IC7 TC7SH08FU
IC8 TC7SH32FU
IC9 TC7SH32FU
IC6.1 TC74VHC08FS
IC6.2
IC6.3
IC6.4
IC10 TC7SH86FU
IC11 TC7SH32FU
IC12 TC7S04F
IC13 TC7SH32FU
H. DRIVE PULSE
V. DRIVE PULSE
SHUTTER PULSE
CN9
to DR
GND
GND
+5V
+5V
+9V
H1L
H1
H2
RG
CP
SHP
LOLUX
+15V
BCP
-10V
V1
V2
V3
V4
TGA
TGB
φSUB
VSUB B
VSUB G
VSUB R
-5V
93421
H1
H2
H-rate
H1
H1L
H-rate
H1
RG
H-rate
H1
CP
H-rate
H1
SHP
(LOLUX OFF)
H-rate
H1
SHP
(LOLUX ON)
H-rate
V3
V4
V-rate
V1
V2
V-rate

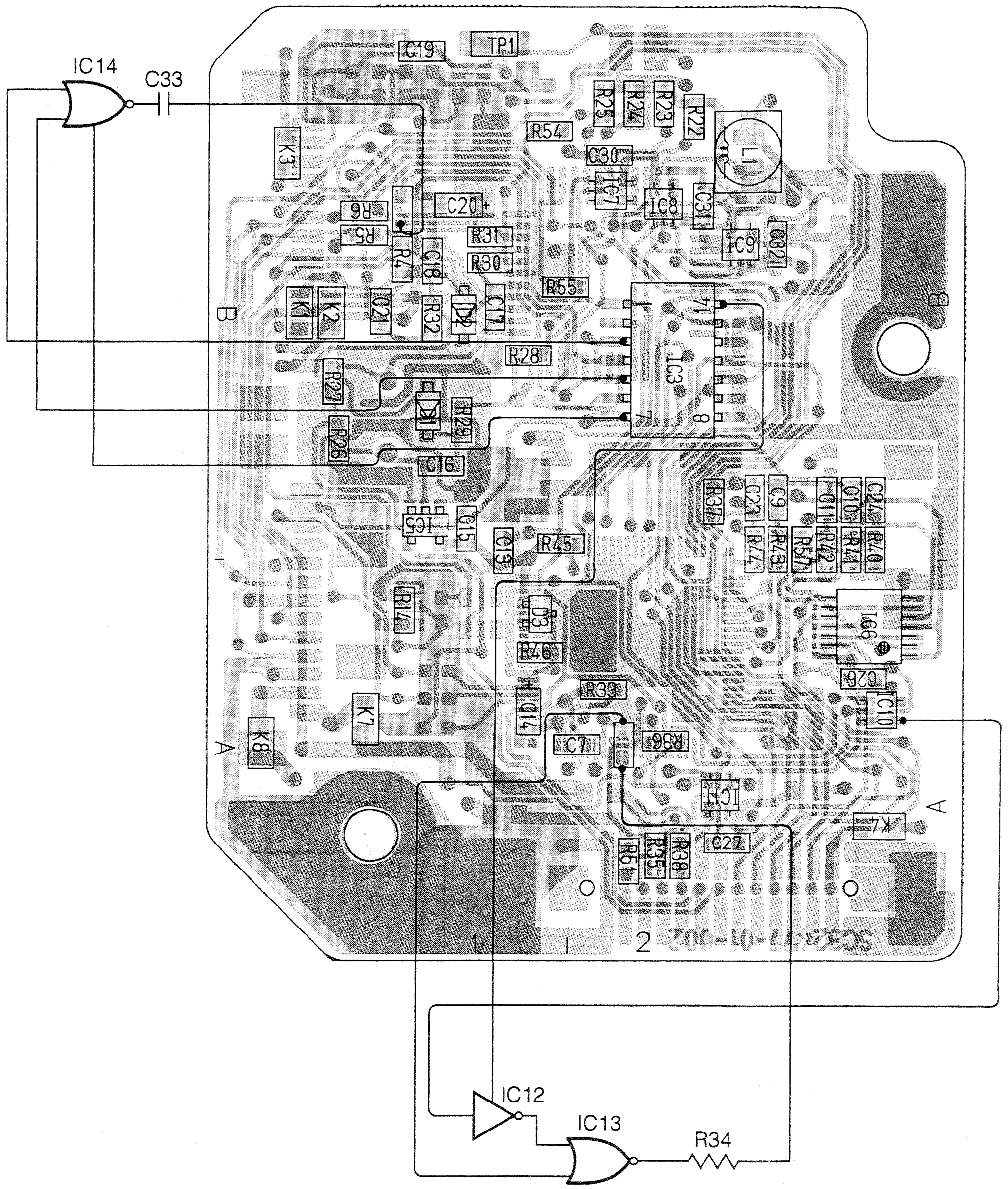
*	R18	R45	X1
NTSC	OPEN	OPEN	CE41081-A0A
PAL	0	0	CE41212-001

3.12 TG CIRCUIT BOARD

– Side A –

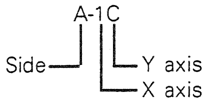

VR8
IC1
IC2
CN9
CN10
CN19
CN21
CN33
X1
TG PWB
ASS'Y
SCK2477-01
-N0A,P0A
A
B
1
2

– Side B –


IC14
C33
IC12
IC13
R34
IC3
TP1
L1
A
B
1
2

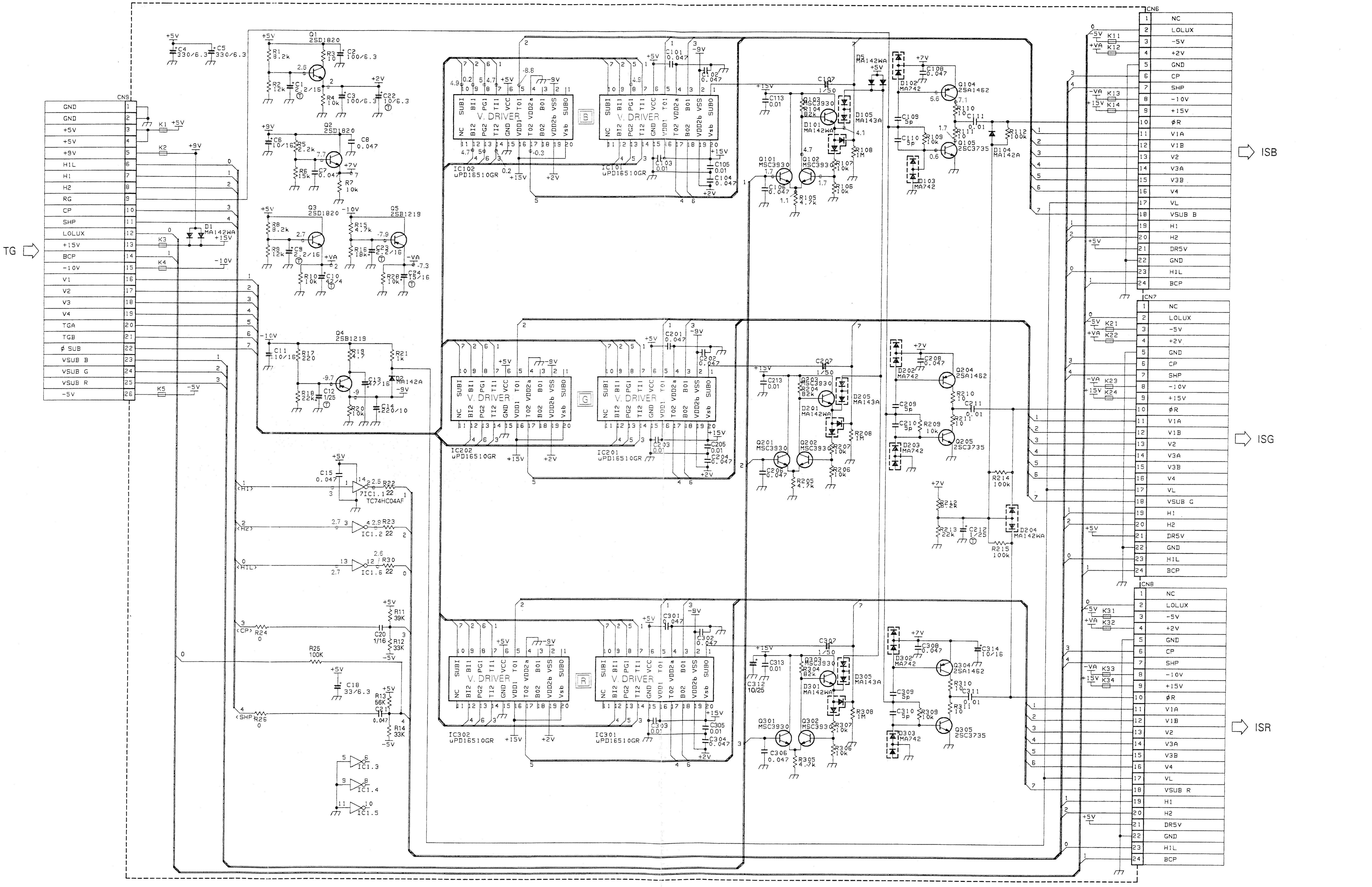
●ADDRESS TABLE OF BOARD PARTS

Each address may have an address error by one interval.

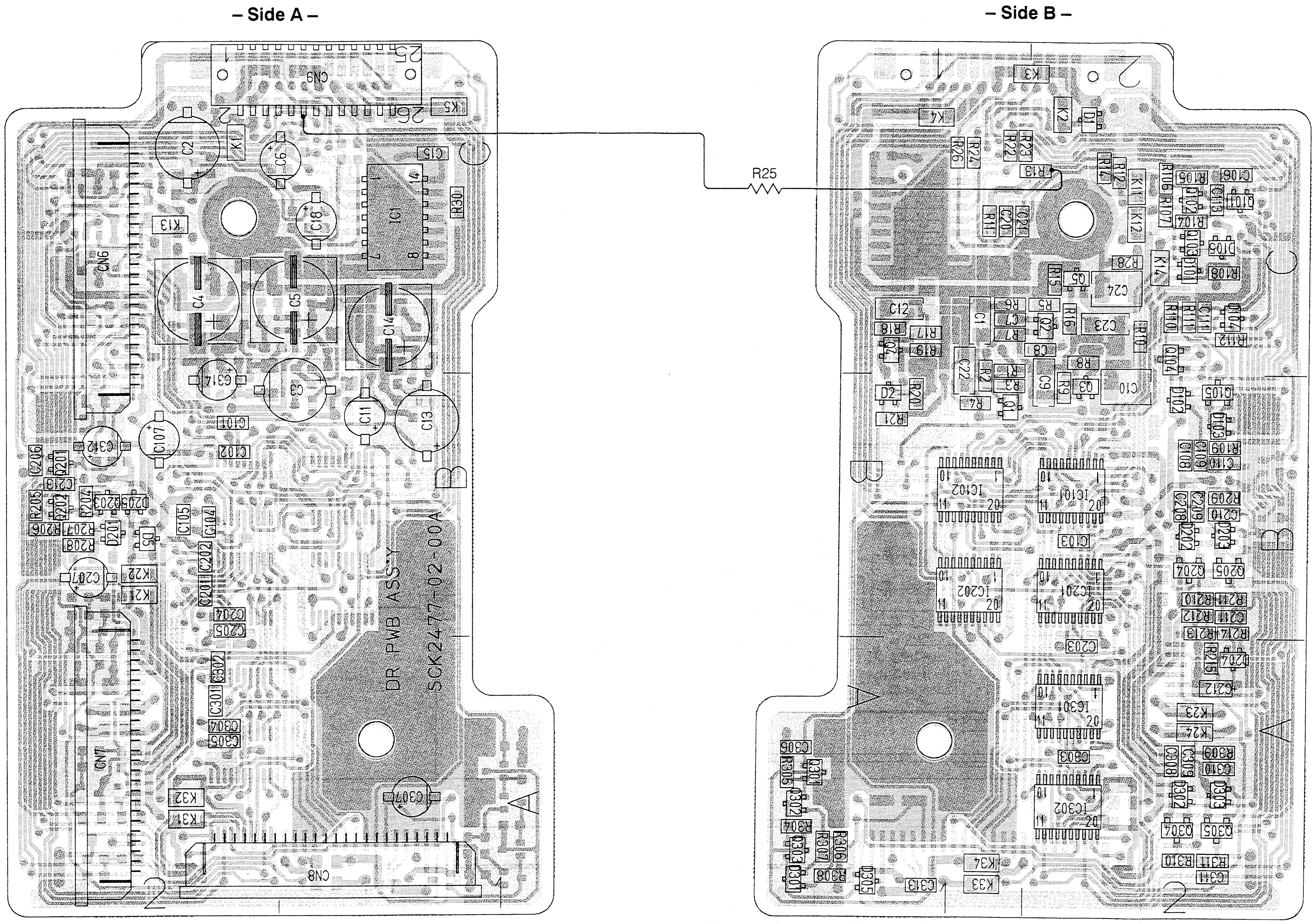

A-1C
Side
Y axis
X axis

IC1	A- 2B	R17	A- 2B	R49	A- 1B	C18	B- 1B	CN10	A- 2A
IC2	A- 2A	R18	A- 2B	R50	A- 2A	C19	B- 1B	CN19	A- 1A
IC3	B- 2B	R19	A- 1B	R51	B- 2A	C20	B- 1B	CN21	A- 1B
IC4	A- 1A	R20	A- 1B	R52	A- 2A	C21	B- 1B	CN33	A- 1A
IC5	B- 1A	R21	A- 1B	R53	A- 2A	C22	A- 1A		
IC6	B- 2A	R22	B- 2B	R54	B- 1B	C23	B- 2A	X1	A- 1B
IC7	B- 2B	R23	B- 2B	R55	B- 1B	C24	B- 2A		
IC8	B- 2B	R24	B- 2B	R56	A- 2A	C25	A- 1B		
IC9	B- 2B	R25	B- 2B	R57	B- 2A	C26	B- 2A		
IC10	B- 2A	R26	B- 1B	R58	A- 1B	C27	B- 2A		
IC11	B- 2A	R27	B- 1B	R59	A- 1B	C30	B- 2B		
		R28	B- 1B	R60	A- 1B	C31	B- 2B		
D1	B- 1B	R29	B- 1B			C32	B- 2B		
D2	B- 1B	R30	B- 1B	VR8	A- 2B	C33	B- 1B		
D3	B- 1A	R31	B- 1B						
		R32	B- 1B	C1	A- 2B	L1	B- 2B		
R1	A- 1B	R33	B- 2A	C2	A- 2B	L2	A- 1B		
R2	A- 1B	R34	B- 2A	C3	A- 2B				
R3	A- 1B	R35	B- 2A	C4	A- 2B	TP1	B- 1B		
R4	B- 1B	R36	B- 2A	C5	A- 2B				
R5	B- 1B	R37	B- 2A	C6	A- 1A	K1	B- 1B		
R6	B- 1B	R38	B- 2A	C7	B- 1A	K2	B- 1B		
R7	A- 1A	R39	A- 2A	C8	A- 2A	K3	B- 1B		
R8	A- 1A	R40	B- 2A	C9	B- 2A	K4	B- 2A		
R9	A- 2B	R41	B- 2A	C10	B- 2A	K7	B- 1A		
R10	A- 2A	R42	B- 2A	C11	B- 2A	K8	B- 1A		
R11	A- 2A	R43	B- 2A	C12	A- 2A	K13	A- 1A		
R12	A- 2A	R44	B- 2A	C13	B- 1A	K14	A- 2A		
R13	A- 1A	R45	B- 1A	C14	B- 1A	K15	A- 2A		
R14	B- 1A	R46	B- 1A	C15	B- 1A	K16	A- 2A		
R15	A- 2B	R47	A- 1B	C16	B- 1B				
R16	A- 2B	R48	A- 1B	C17	B- 1B	CN9	A- 2A		

3.13 DR BOARD SCHEMATIC DIAGRAM 03


TG
CN5
GND
+5V
+9V
HIL
H1
H2
RG
CP
SHP
LOLUX
+15V
BCP
-10V
V1
V2
V3
V4
TGA
TGB
φ SUB
VSUB B
VSUB G
VSUB R
-5V
K1
K2
K3
K4
K5
D1 MA142WA
Q1 2SD1820
Q2 2SD1820
Q3 2SD1820
Q4 2SB1219
Q5 2SB1219
D2 MA142A
IC1.1 TC74HC04AF
IC1.2
IC1.3
IC1.4
IC1.5
IC1.6
V. DRIVER
IC101 uPD16510GR
IC102 uPD16510GR
IC201 uPD16510GR
IC202 uPD16510GR
IC301 uPD16510GR
IC302 uPD16510GR
B
G
R
SUBI
BI1
PG1
TI1
VCC
GND
VDD1
TO1
TO2
VDD2a
BO1
BO2
VDD2b
VSS
Vsb
SUBO
NC
BI2
PG2
TI2
Q101 MSC3930
Q102 MSC3930
Q103 MSC3930
Q104 2SA1462
Q105 2SC3735
Q201 MSC3930
Q202 MSC3930
Q203 MSC3930
Q204 2SA1462
Q205 2SC3735
Q301 MSC3930
Q302 MSC3930
Q303 MSC3930
Q304 2SA1462
Q305 2SC3735
D5 MA142WA
D101 MA142WA
D102 MA742
D103 MA742
D104 MA142A
D105 MA143A
D201 MA142WA
D202 MA742
D203 MA742
D204 MA142WA
D205 MA143A
D301 MA142WA
D302 MA742
D303 MA742
D305 MA143A
CN6
CN7
CN8
NC
LOLUX
-5V
+2V
GND
CP
SHP
-10V
+15V
φR
V1A
V1B
V2
V3A
V3B
V4
VL
VSUB B
VSUB G
VSUB R
H1
H2
DR5V
HIL
BCP
ISB
ISG
ISR
92561

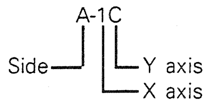
3.14 DR CIRCUIT BOARD


– Side A –

– Side B –

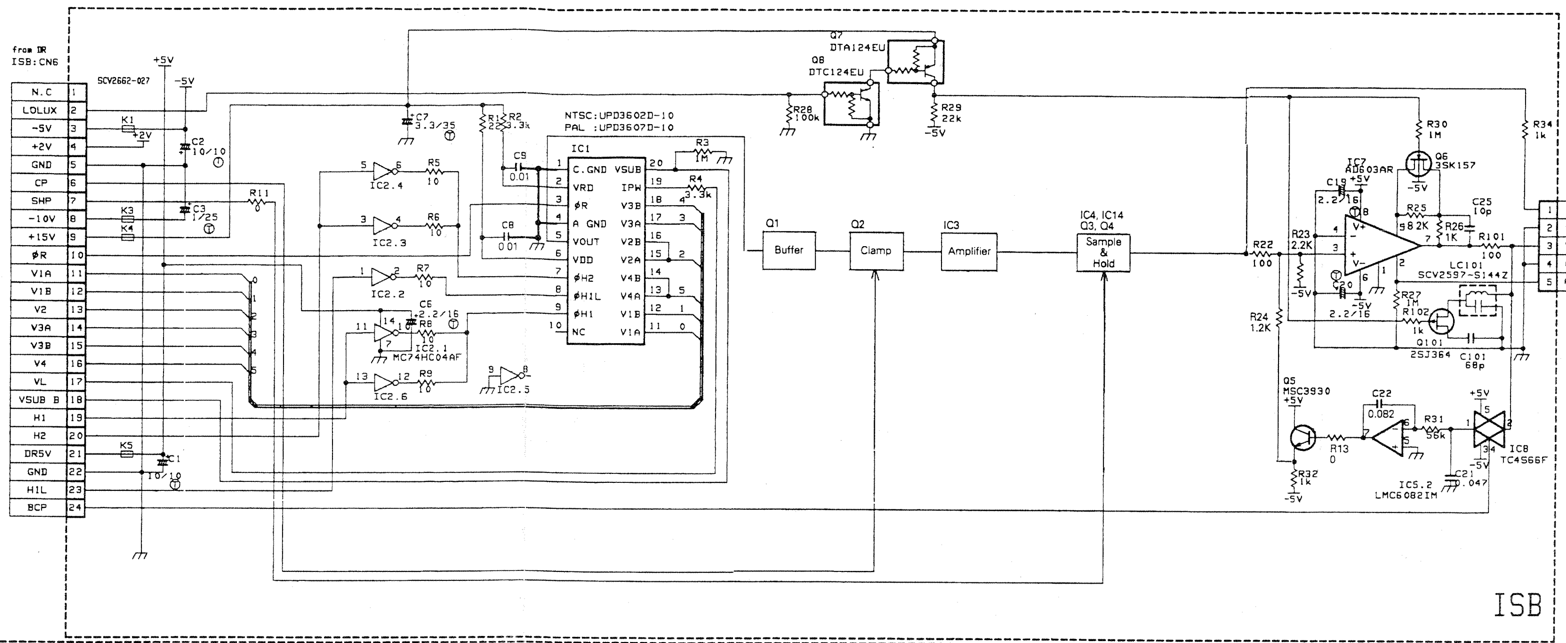
●ADDRESS TABLE OF BOARD PARTS

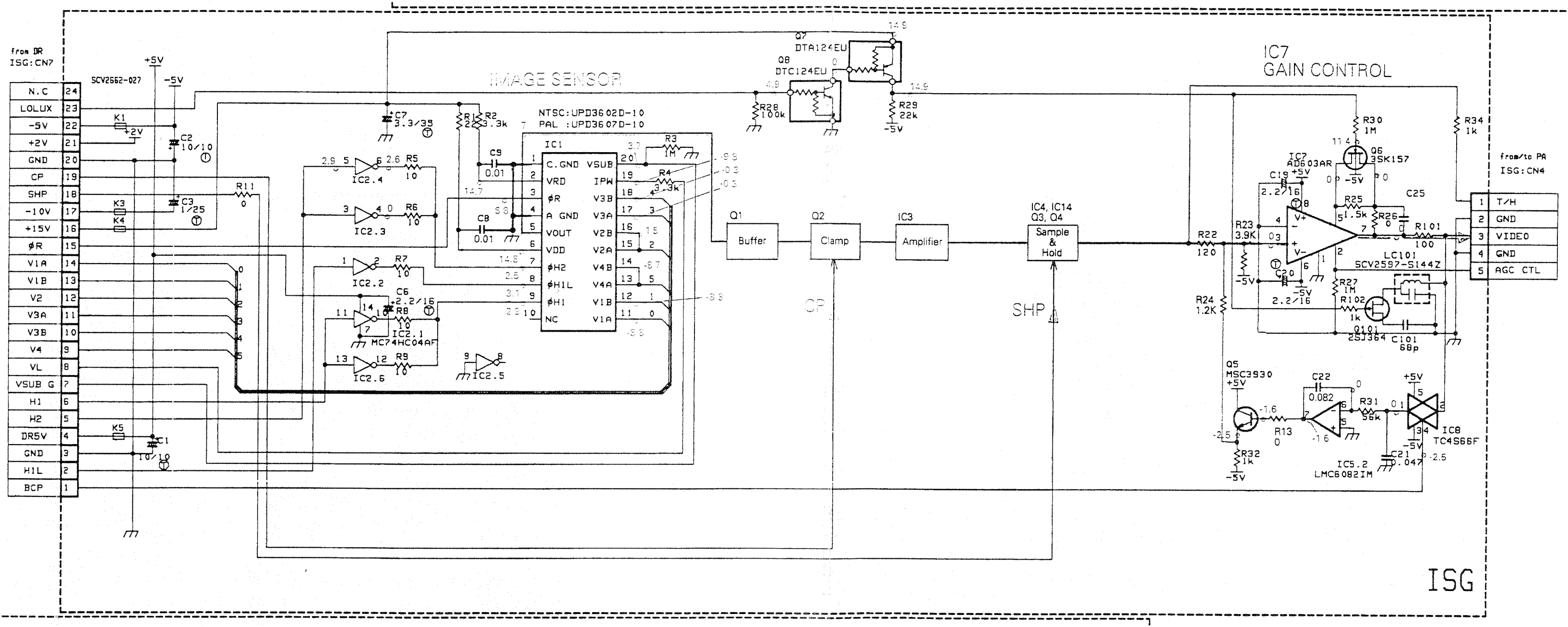
Each address may have an address error by one interval.

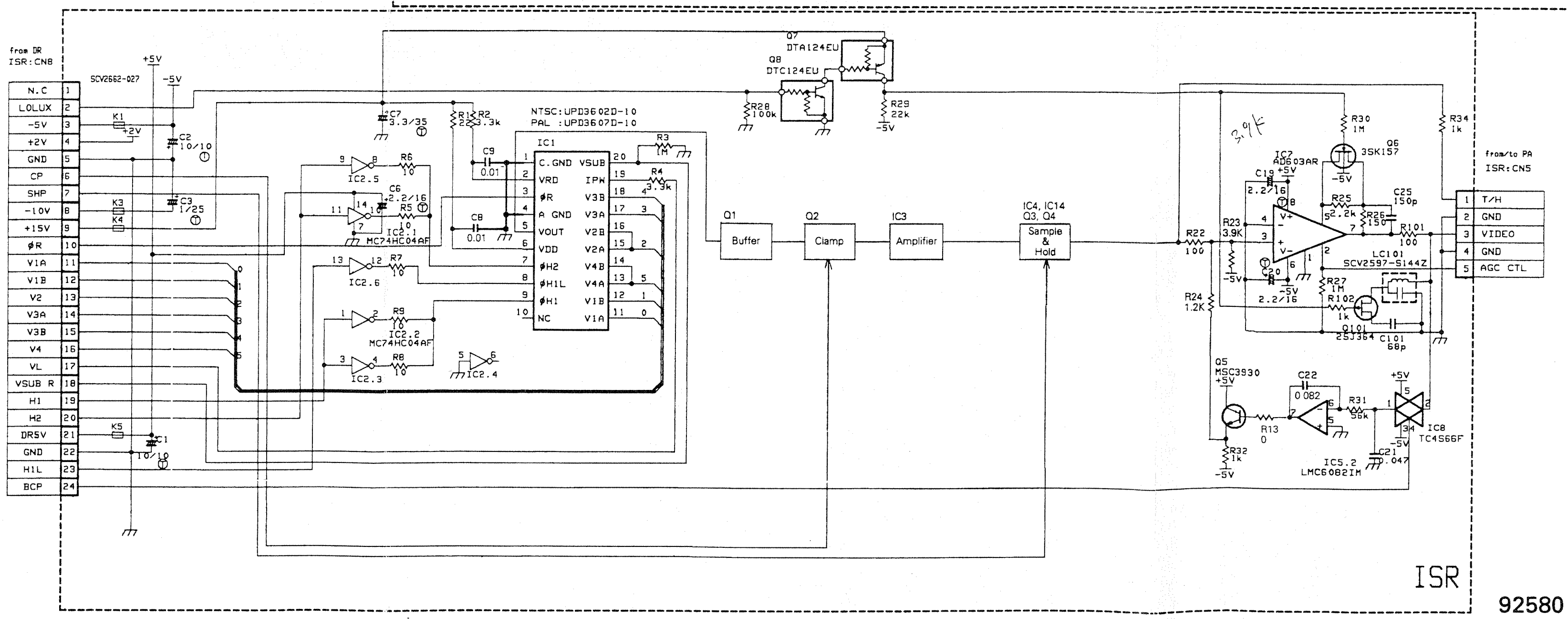


IC1	A- 1C
IC101	B- 2B
IC102	B- 1B
IC201	B- 2B
IC202	B- 1B
IC301	B- 2A
IC302	B- 2A
Q1	B- 1B
Q2	B- 2C
Q3	B- 2B
Q4	B- 1B
Q5	B- 2C
Q101	B- 2C
Q102	B- 2C
Q103	B- 2C
Q104	B- 2B
Q105	B- 2B
Q201	A- 2B
Q202	A- 2B
Q203	A- 2B
Q204	B- 2B
Q205	B- 2B
Q301	B- 1A
Q302	B- 1A
Q303	B- 1A
Q304	B- 2A
Q305	B- 2A
D1	B- 2C
D2	B- 1B
D5	A- 2B
D101	B- 2C
D102	B- 2B
D103	B- 2B
D104	B- 2C
D105	B- 2C
D201	A- 2B
D202	B- 2B
D203	B- 2B
D204	B- 2A
D205	A- 2B
D301	B- 1A
D302	B- 2A
D303	B- 2A
D305	B- 1A
R1	B- 1B
R2	B- 1B
R3	B- 1B
R4	B- 1B
R5	B- 2C
R6	B- 1C
R7	B- 1C
R8	B- 2B
R9	B- 2B
R10	B- 2B
R11	B- 1C
R12	B- 2C
R13	B- 2C
R14	B- 2C
R15	B- 2C
R16	B- 2C
R17	B- 1C
R18	B- 1C
R19	B- 1B
R20	B- 1B
R21	B- 1B
R22	B- 1C
R23	B- 1C
R24	B- 1C
R26	B- 1C
R28	B- 2C
R30	A- 1C
R104	B- 2C
R105	B- 2C
R106	B- 2C
R107	B- 2C
R108	B- 2C
R109	B- 2B
R110	B- 2C
R111	B- 2C
R112	B- 2B
R204	A- 2B
R205	A- 2B
R206	A- 2B
R207	A- 2B
R208	A- 2B
R209	B- 2B
R210	B- 2B
R211	B- 2B
R212	B- 2B
R213	B- 2A
R214	B- 2A
R215	B- 2A
R304	B- 1A
R305	B- 1A
R306	B- 1A
R307	B- 1A
R308	B- 1A
R309	B- 2A
R310	B- 2A
R311	B- 2A
C1	B- 1C
C2	A- 2C
C3	A- 1B
C4	A- 2C
C5	A- 1C
C6	A- 1C
C7	B- 1C
C8	B- 2B
C9	B- 2B
C10	B- 2B
C11	A- 1B
C12	B- 1C
C13	A- 1B
C14	A- 1C
C15	A- 1C
C18	A- 1C
C20	B- 1C
C21	B- 1C
C22	B- 1B
C23	B- 2C
C24	B- 2C
C101	A- 2B
C102	A- 2B
C103	B- 2B
C104	A- 2B
C105	A- 2B
C106	B- 2C
C107	A- 2B
C108	B- 2B
C109	B- 2B
C110	B- 2B
C111	B- 2C
C113	B- 2C
C201	A- 2B
C202	A- 2B
C203	B- 2A
C204	A- 2B
C205	A- 2A
C206	A- 2B
C207	A- 2B
C208	B- 2B
C209	B- 2B
C210	B- 2B
C211	B- 2B
C212	B- 2A
C213	A- 2B
C301	A- 2A
C302	A- 2A
C303	B- 2A
C304	A- 2A
C305	A- 2A
C306	B- 1A
C307	A- 1A
C308	B- 2A
C309	B- 2A
C310	B- 2A
C311	B- 2A
C312	A- 2B
C313	B- 1A
C314	A- 2B
CN6	A- 2C
CN7	A- 2A
CN8	A- 1A
CN9	A- 1C
K1	A- 2C
K2	B- 2C
K3	B- 1C
K4	B- 1C
K5	A- 1C
K11	B- 2C
K12	B- 2C
K13	A- 2C
K14	B- 2C
K21	A- 2B
K22	A- 2B
K23	B- 2A
K24	B- 2A
K31	A- 2A
K32	A- 2A
K33	B- 1A
K34	B- 1A

3.15 ISB/ISG/ISR BOARD SCHEMATIC DIAGRAMS 04/05/06


from DR
ISB:CN6
N.C
LOLUX
-5V
+2V
GND
CP
SHP
-10V
+15V
φR
V1A
V1B
V2
V3A
V3B
V4
VL
VSUB B
H1
H2
DRSV
GND
H1L
BCP
SCV2662-027
+5V
-5V
K1
K3
K4
K5
C2 10/10
C3 1/25
C1 10/10
C7 3.3/35
R1
R2 3.3k
R11
NTSC:UPD3602D-10
PAL :UPD3607D-10
IC1
C.GND
VRD
φR
A GND
VOUT
VDD
φH2
φH1L
φH1
NC
VSUB
IPW
V3B
V3A
V2B
V2A
V4B
V4A
V1B
V1A
C9 0.01
C8 0.01
R3 1M
R4 3.3k
R5 10
R6 10
R7 10
R8 10
R9 10
C6 2.2/16
IC2.1
IC2.2
IC2.3
IC2.4
IC2.5
IC2.6
MC74HC04AF
Q7 DTA124EU
Q8 DTC124EU
R28 100k
R29 22k
Q1 Buffer
Q2 Clamp
IC3 Amplifier
IC4, IC14 Q3, Q4 Sample & Hold
R22 100
R23 2.2K
R24 1.2K
IC7 AD603AR
C18 2.2/16
C20 2.2/16
R25 8.2K
R26 1K
R27 1M
R30 1M
R34 1k
Q6 3SK157
C25 10p
R101 100
LC101 SCV2597-S144Z
R102 1K
Q101 2SJ364
C101 68p
Q5 MSC3930
C22 0.082
R31 56k
R13 0
R32 1k
IC5.2 LMC6082IM
C21 .047
IC8 TC4S66F
from/to PA
ISB:CN3
T/H
GND
VIDEO
GND
AGC CTL
ISB


from DR
ISG:CN7
N.C
LOLUX
-5V
+2V
GND
CP
SHP
-10V
+15V
φR
V1A
V1B
V2
V3A
V3B
V4
VL
VSUB G
H1
H2
DRSV
GND
H1L
BCP
SCV2662-027
IMAGE SENSOR
NTSC:UPD3602D-10
PAL :UPD3607D-10
IC1
Q7 DTA124EU
Q8 DTC124EU
R28 100k
R29 22k
Q1 Buffer
Q2 Clamp
IC3 Amplifier
IC4, IC14 Q3, Q4 Sample & Hold
CP
SHP
IC7
GAIN CONTROL
AD603AR
R22 120
R23 3.9K
R24 1.2K
R25 1.5k
R26
C25
R101 100
LC101 SCV2597-S144Z
R102 1k
Q101 2SJ364
C101 68p
Q5 MSC3930
C22 0.082
R31 56k
IC5.2 LMC6082IM
IC8 TC4S66F
from/to PA
ISG:CN4
T/H
GND
VIDEO
GND
AGC CTL
ISG

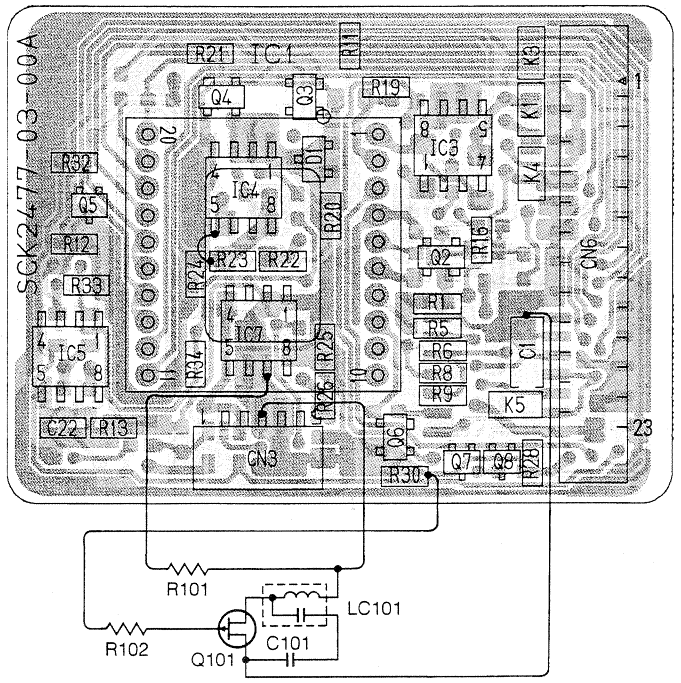

from DR
ISR:CN8
N.C
LOLUX
-5V
+2V
GND
CP
SHP
-10V
+15V
φR
V1A
V1B
V2
V3A
V3B
V4
VL
VSUB R
H1
H2
DRSV
GND
H1L
BCP
SCV2662-027
NTSC:UPD3602D-10
PAL :UPD3607D-10
IC1
MC74HC04AF
Q7 DTA124EU
Q8 DTC124EU
R28 100k
R29 22k
Q1 Buffer
Q2 Clamp
IC3 Amplifier
IC4, IC14 Q3, Q4 Sample & Hold
IC7 AD603AR
R22 100
R23 3.9K
R24 1.2K
R25 2.2k
R26 150
C25 150p
R101 100
LC101 SCV2597-S144Z
R102 1k
Q101 2SJ364
C101 68p
Q5 MSC3930
C22 0.082
R31 56k
IC5.2 LMC6082IM
IC8 TC4S66F
from/to PA
ISR:CN5
T/H
GND
VIDEO
GND
AGC CTL
ISR

92580

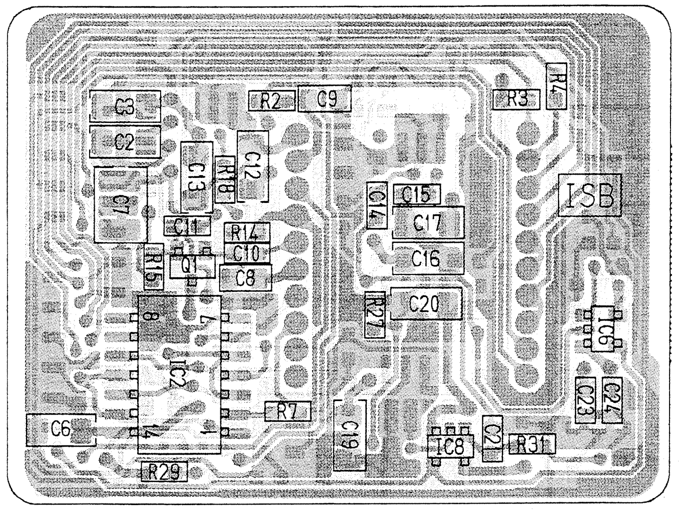
3.16 ISB/ISG/ISR CIRCUIT BOARDS

• ISB board

– Side A –

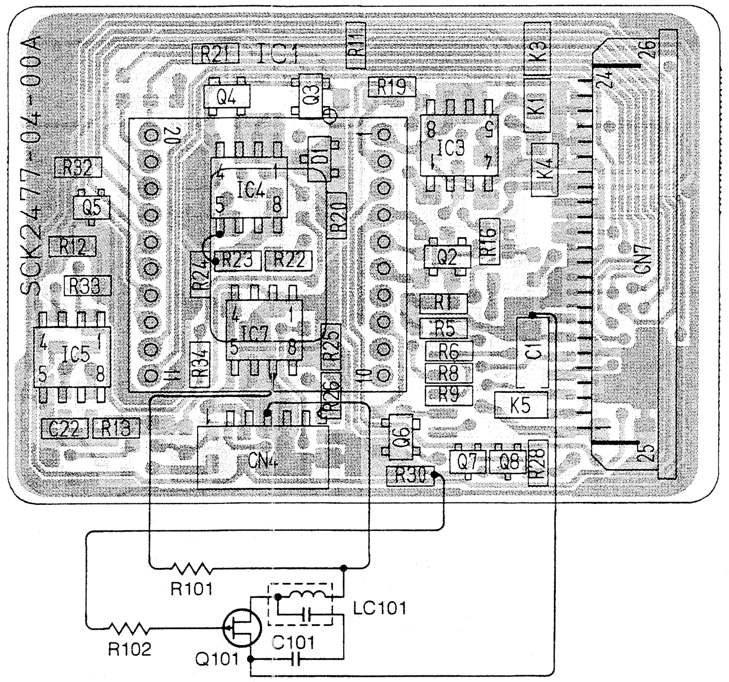

SCK2477-03-00A
CN3
CN6
IC3
IC4
IC5
IC7
R101
R102
Q101
C101
LC101

– Side B –

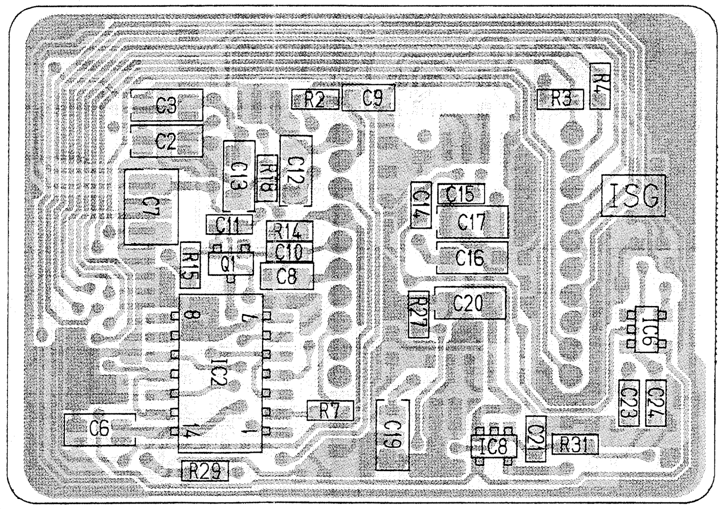

ISB
IC2
IC6
IC8

• ISG board

– Side A –

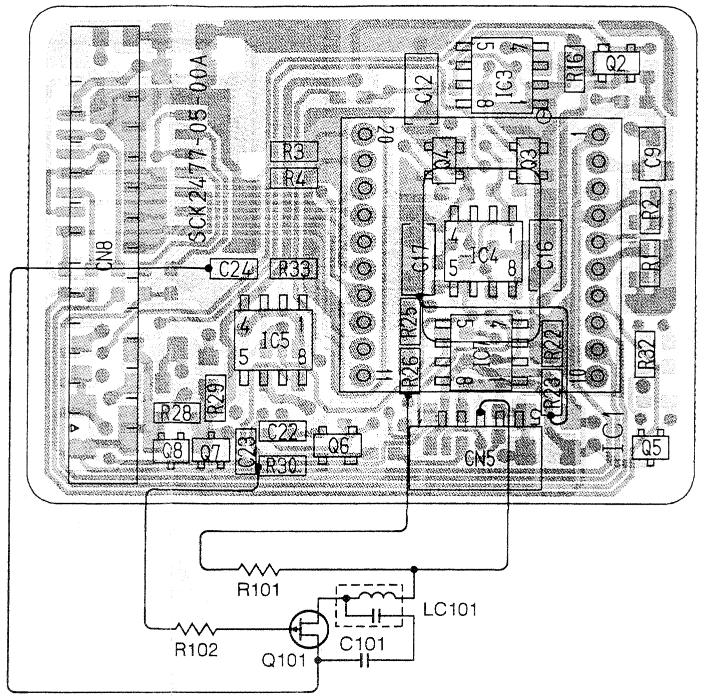

SCK2477-04-00A
CN4
CN7
IC3
IC4
IC5
IC7
R101
R102
Q101
C101
LC101

– Side B –

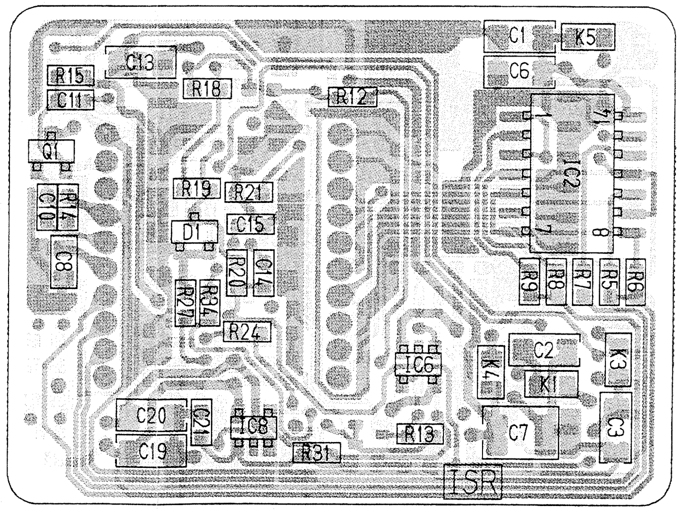

ISG
IC2
IC6
IC8

• ISR board

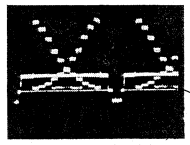
– Side A –


SCK2477-05-00A
CN5
CN8
IC3
IC4
IC5
IC7
R101
R102
Q101
C101
LC101

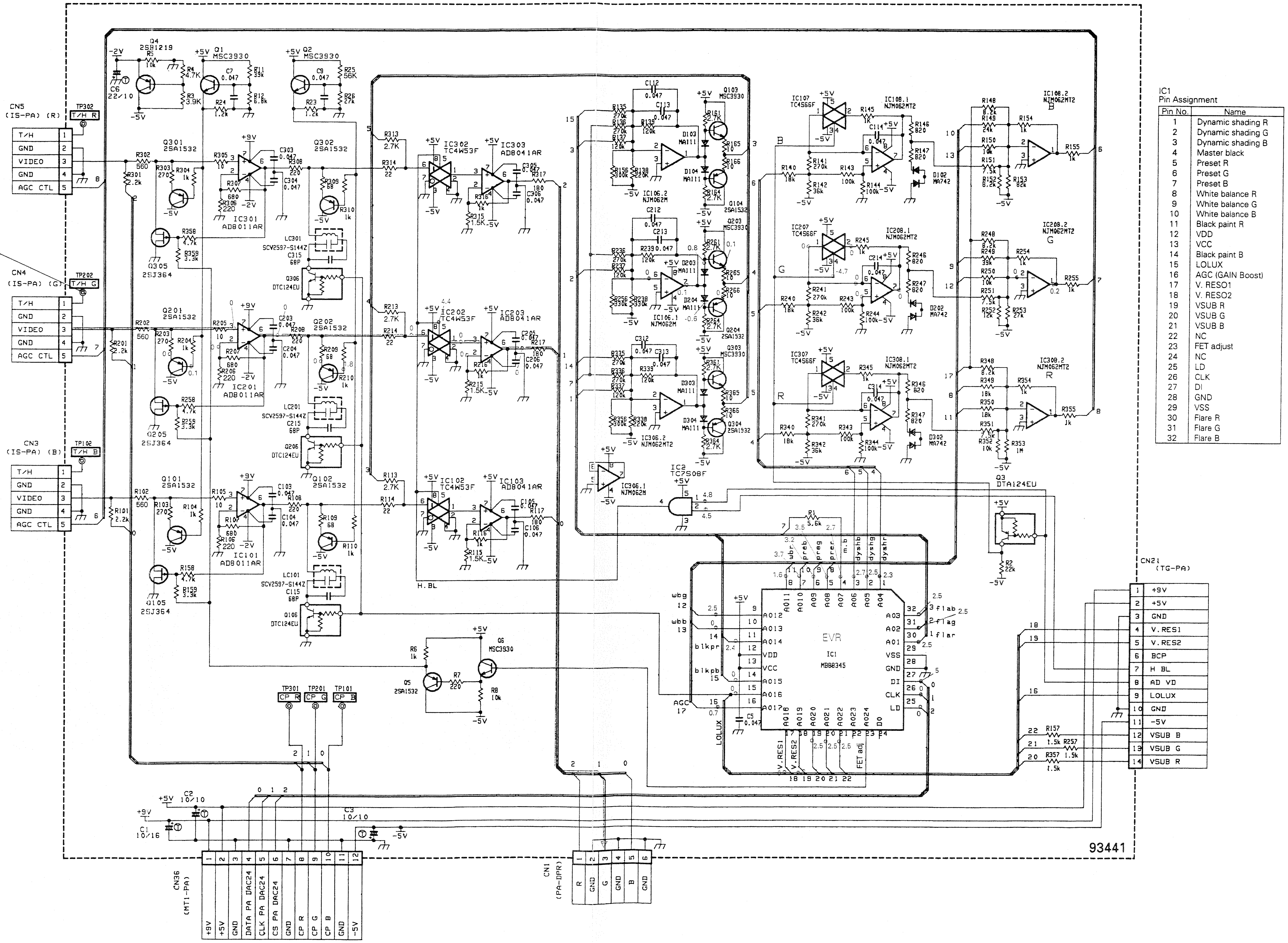
– Side B –


ISR
IC2
IC6
IC8

3.17 PA BOARD SCHEMATIC DIAGRAM 07



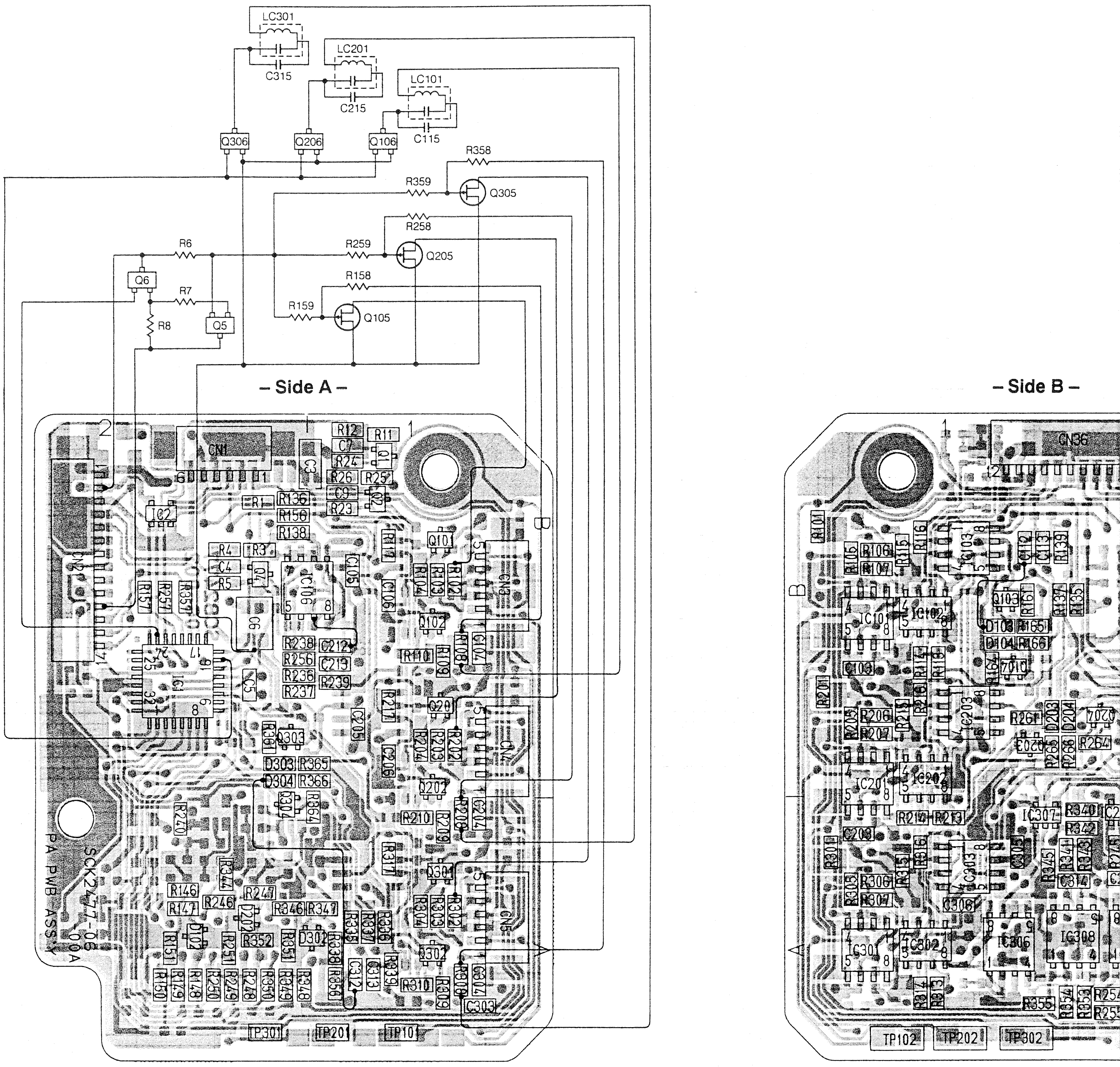
H-rate, 0.7Vp-p


CN5 (IS-PA) (R)
TP302 T/H R
T/H
GND
VIDEO
GND
AGC CTL
CN4 (IS-PA) (G)
TP202 T/H G
CN3 (IS-PA) (B)
TP102 T/H B
Q4 2SB1219
Q1 MSC3930
Q2 MSC3930
Q301 2SA1532
Q302 2SA1532
IC301 AD8011AR
IC302 TC4W53F
IC303 AD8041AR
Q305 2SJ364
LC301 SCV2597-S144Z
Q306 DTC124EU
Q201 2SA1532
Q202 2SA1532
IC201 AD8011AR
IC202 TC4W53F
IC203 AD8041AR
Q205 2SJ364
LC201 SCV2597-S144Z
Q206 DTC124EU
Q101 2SA1532
Q102 2SA1532
IC101 AD8011AR
IC102 TC4W53F
IC103 AD8041AR
Q105 2SJ364
LC101 SCV2597-S144Z
Q106 DTC124EU
H.BL
Q5 2SA1532
Q6 MSC3930
TP301 CP R
TP201 CP G
TP101 CP B
Q103 MSC3930
Q104 2SA1532
Q203 MSC3930
Q204 2SA1532
Q303 MSC3930
Q304 2SA1532
IC106.1 NJM062M
IC106.2 NJM062M
IC306.1 NJM062M
IC306.2 NJM062MT2
IC2 TC7S08F
IC107 TC4S66F
IC108.1 NJM062MT2
IC108.2 NJM062MT2
IC207 TC4S66F
IC208.1 NJM062MT2
IC208.2 NJM062MT2
IC307 TC4S66F
IC308.1 NJM062MT2
IC308.2 NJM062MT2
Q3 DTA124EU
EVR IC1 MB88345
CN21 (TG-PA)
1 +9V
2 +5V
3 GND
4 V.RES1
5 V.RES2
6 BCP
7 H BL
8 AD VD
9 LOLUX
10 GND
11 -5V
12 VSUB B
13 VSUB G
14 VSUB R
CN36 (MT1-PA)
+9V
+5V
GND
DATA PA DAC24
CLK PA DAC24
CS PA DAC24
GND
CP R
CP G
CP B
GND
-5V
CN1 (PA-DPR)
R
GND
G
GND
B
GND
93441

IC1
Pin Assignment

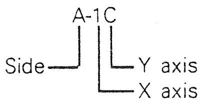
Pin No.	Name
1	Dynamic shading R
2	Dynamic shading G
3	Dynamic shading B
4	Master black
5	Preset R
6	Preset G
7	Preset B
8	White balance R
9	White balance G
10	White balance B
11	Black paint R
12	VDD
13	VCC
14	Black paint B
15	LOLUX
16	AGC (GAIN Boost)
17	V. RESO1
18	V. RESO2
19	VSUB R
20	VSUB G
21	VSUB B
22	NC
23	FET adjust
24	NC
25	LD
26	CLK
27	DI
28	GND
29	VSS
30	Flare R
31	Flare G
32	Flare B

3.18 PA CIRCUIT BOARD



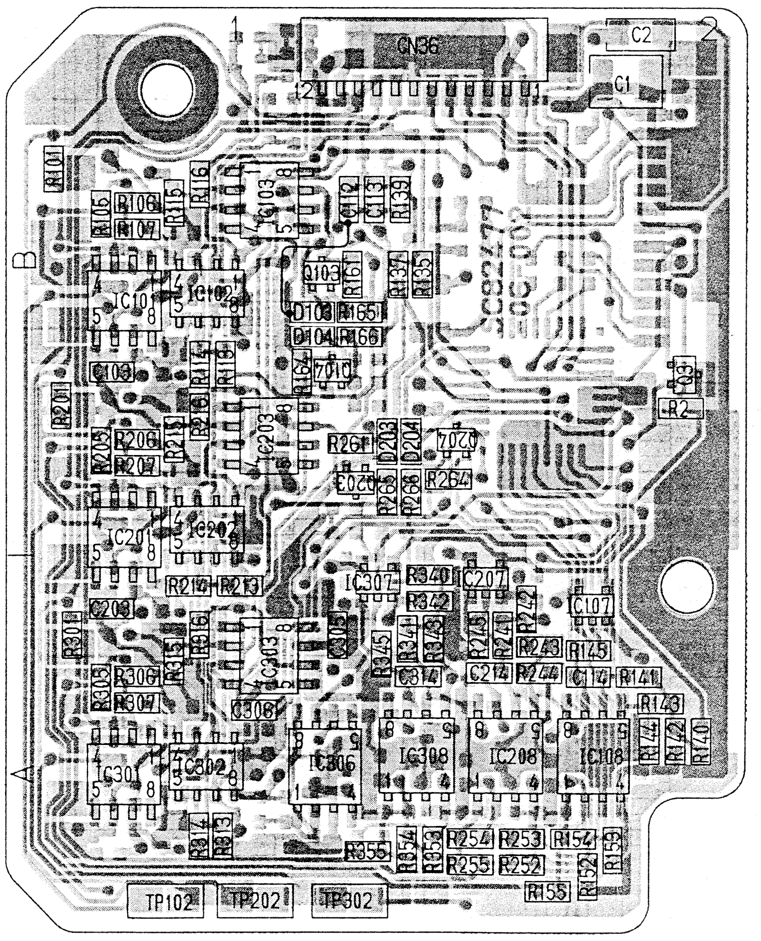
●ADDRESS TABLE OF BOARD PARTS

Each address may have an address error by one interval.



IC1	A- 2B
IC2	A- 2B
IC101	B- 1B
IC102	B- 1B
IC103	B- 1B
IC106	A- 1B
IC107	B- 2A
IC108	B- 2A
IC201	B- 1A
IC202	B- 1A
IC203	B- 1B
IC207	B- 2A
IC208	B- 2A
IC301	B- 1A
IC302	B- 1A
IC303	B- 1A
IC306	B- 1A
IC307	B- 2A
IC308	B- 2A
Q1	A- 1B
Q2	A- 1B
Q3	B- 2B
Q4	A- 2B
Q101	A- 1B
Q102	A- 1B
Q103	B- 1B
Q104	B- 1B
Q201	A- 1B
Q202	A- 1A
Q203	B- 1B
Q204	B- 2B
Q301	A- 1A
Q302	A- 1A
Q303	A- 2B
Q304	A- 2A
D102	A- 2A
D202	A- 2A
D302	A- 1A
R1	A- 2B
R2	B- 2B
R3	A- 2B
R4	A- 2B
R5	A- 2B
R11	A- 1B
R12	A- 1B
R23	A- 1B
R24	A- 1B
R25	A- 1B
R26	A- 1B
R101	B- 1B
R102	A- 1B
R103	A- 1B
R104	A- 1B
R105	B- 1B
R106	B- 1B
R107	B- 1B
R108	A- 1B
R109	A- 1B
R110	A- 1B
R113	B- 1B
R114	B- 1B
R115	B- 1B
R116	B- 1B
R117	A- 1B
R135	B- 2B
R136	A- 2B
R137	B- 2B
R138	A- 2B
R139	B- 2B
R140	B- 2A
R141	B- 2A
R142	B- 2A
R143	B- 2A
R144	B- 2A
R145	B- 2A
R146	A- 2A
R147	A- 2A
R148	A- 2A
R149	A- 2A
R150	A- 2A
R151	A- 2A
R152	B- 2A
R153	B- 2A
R154	B- 2A
R155	B- 2A
R156	A- 2B
R157	A- 2B
R161	B- 1B
R162	B- 1B
R163	B- 1B
R164	B- 1B
R165	B- 1B
R166	B- 1B
R201	B- 1B
R202	A- 1B
R203	A- 1B
R204	A- 1B
R205	B- 1B
R206	B- 1B
R207	B- 1B
R208	A- 1A
R209	A- 1A
R210	A- 1A
R213	B- 1A
R214	B- 1A
R215	B- 1B
R216	B- 1B
R217	A- 1B
R236	A- 2B
R237	A- 2B
R238	A- 2B
R239	A- 1B
R240	A- 2A
R241	B- 2A
R242	B- 2A
R243	B- 2A
R244	B- 2A
R245	B- 2A
R246	A- 2A
R247	A- 2A
R248	A- 2A
R249	A- 2A
R250	A- 2A
R251	A- 2A
R252	B- 2A
R253	B- 2A
R254	B- 2A
R255	B- 2A
R256	A- 2B
R257	A- 2B
R261	B- 1B
R262	B- 2B
R263	B- 2B
R264	B- 2B
R265	B- 2A
R266	B- 2A
R301	B- 1A
R302	A- 1A
R303	A- 1A
R304	A- 1A
R305	B- 1A
R306	B- 1A
R307	B- 1A
R308	A- 1A
R309	A- 1A
R310	A- 1A
R313	B- 1A
R314	B- 1A
R315	B- 1A
R316	B- 1A
R317	A- 1A
R335	A- 1A
R336	A- 1A
R337	A- 1A
R338	A- 1A
R339	A- 1A
R340	B- 2A
R341	B- 2A
R342	B- 2A
R343	B- 2A
R344	A- 2A
R345	B- 2A
R346	A- 2A
R347	A- 1A
R348	A- 1A
R349	A- 2A
R350	A- 2A
R351	A- 2A
R352	A- 2A
R353	B- 2A
R354	B- 2A
R355	B- 2A
R356	A- 1A
R357	A- 2B
R361	A- 2B
R362	A- 2A
R363	A- 2A
R364	A- 1A
R365	A- 1A
R366	A- 1A
C1	B- 2B
C2	B- 2B
C3	A- 1B
C4	A- 2B
C5	A- 2B
C6	A- 2B
C7	A- 1B
C9	A- 1B
C103	B- 1B
C104	A- 1B
C105	A- 1B
C106	A- 1B
C112	B- 1B
C113	B- 2B
C114	B- 2A
C203	B- 1A
C204	A- 1A
C205	A- 1B
C206	A- 1A
C212	A- 1B
C213	A- 1B
C214	B- 2A
C303	A- 1A
C304	A- 1A
C305	B- 1A
C306	B- 1A
C312	A- 1A
C313	A- 1A
C314	B- 2A
TP101	A- 1A
TP102	B- 1A
TP201	A- 1A
TP202	B- 1A
TP301	A- 2A
TP302	B- 1A
CN1	A- 2B
CN3	A- 1B
CN4	A- 1B
CN5	A- 1A
CN21	A- 2B
CN36	B- 2B

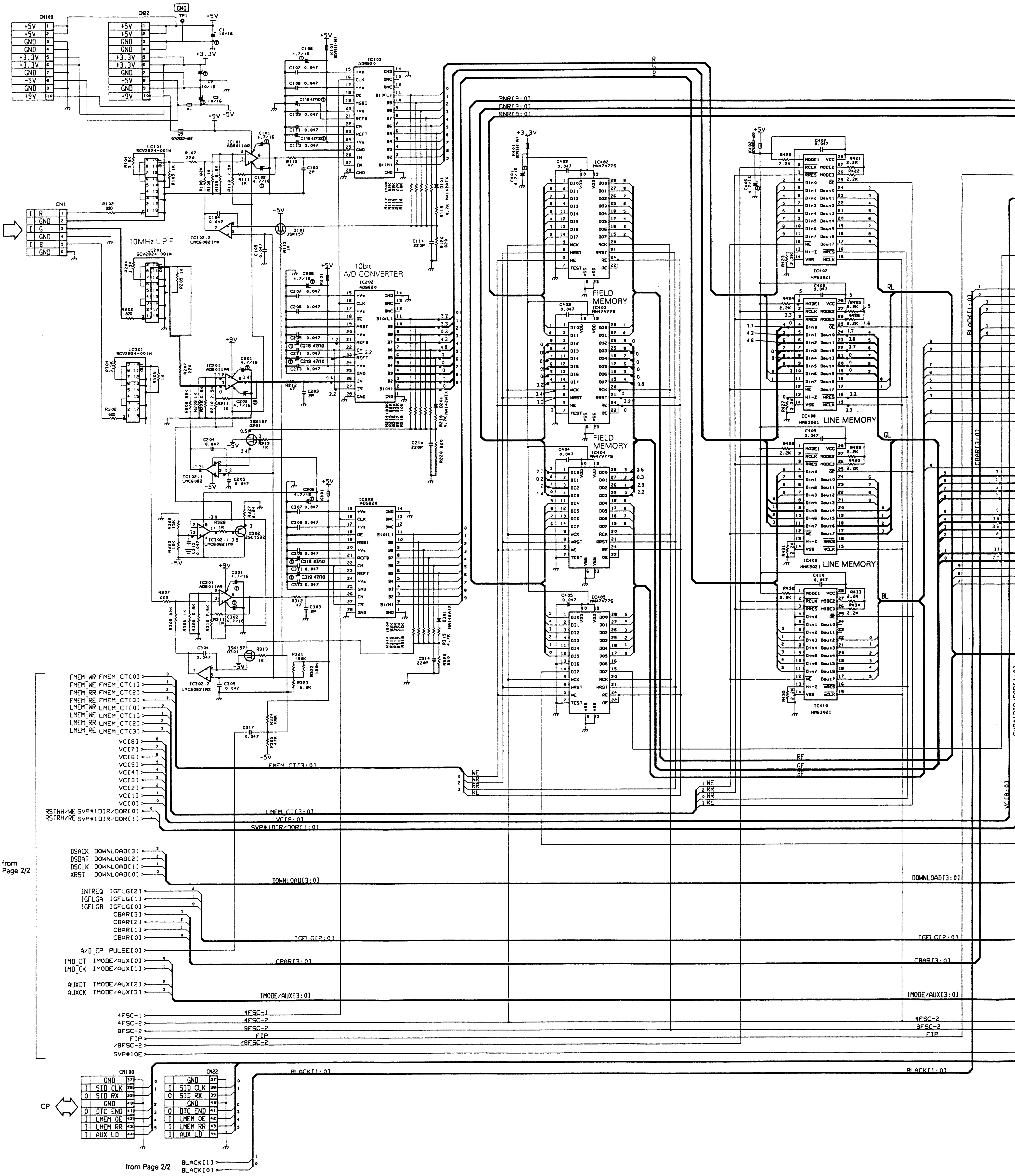
– Side B –

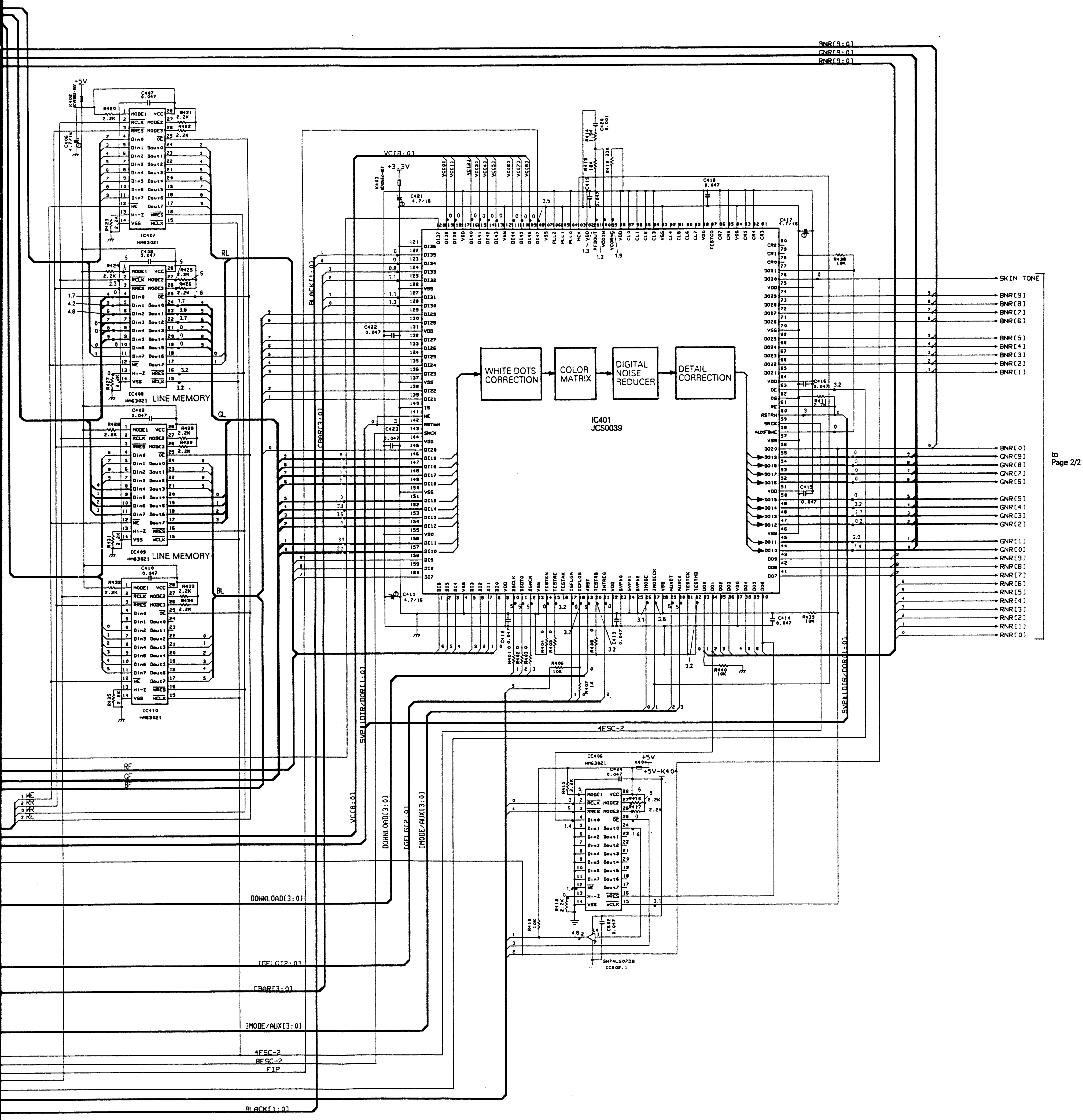


CN36
C2
C1
1
2
B
A
R101
R105
R106
R107
R116
IC103
IC101
IC102
Q103
R161
D103
D104
R165
R166
C103
R201
IC203
IC201
IC202
R261
D203
D204
C204
R264
R263
C208
IC307
R340
C207
C107
IC303
R345
R341
R343
C314
C214
R244
C114
R141
R143
R142
R140
IC301
IC302
IC306
IC308
IC208
IC108
R355
R354
R254
R253
R154
R255
R252
R155
R153
R152
R3
R2
TP102
TP202
TP302

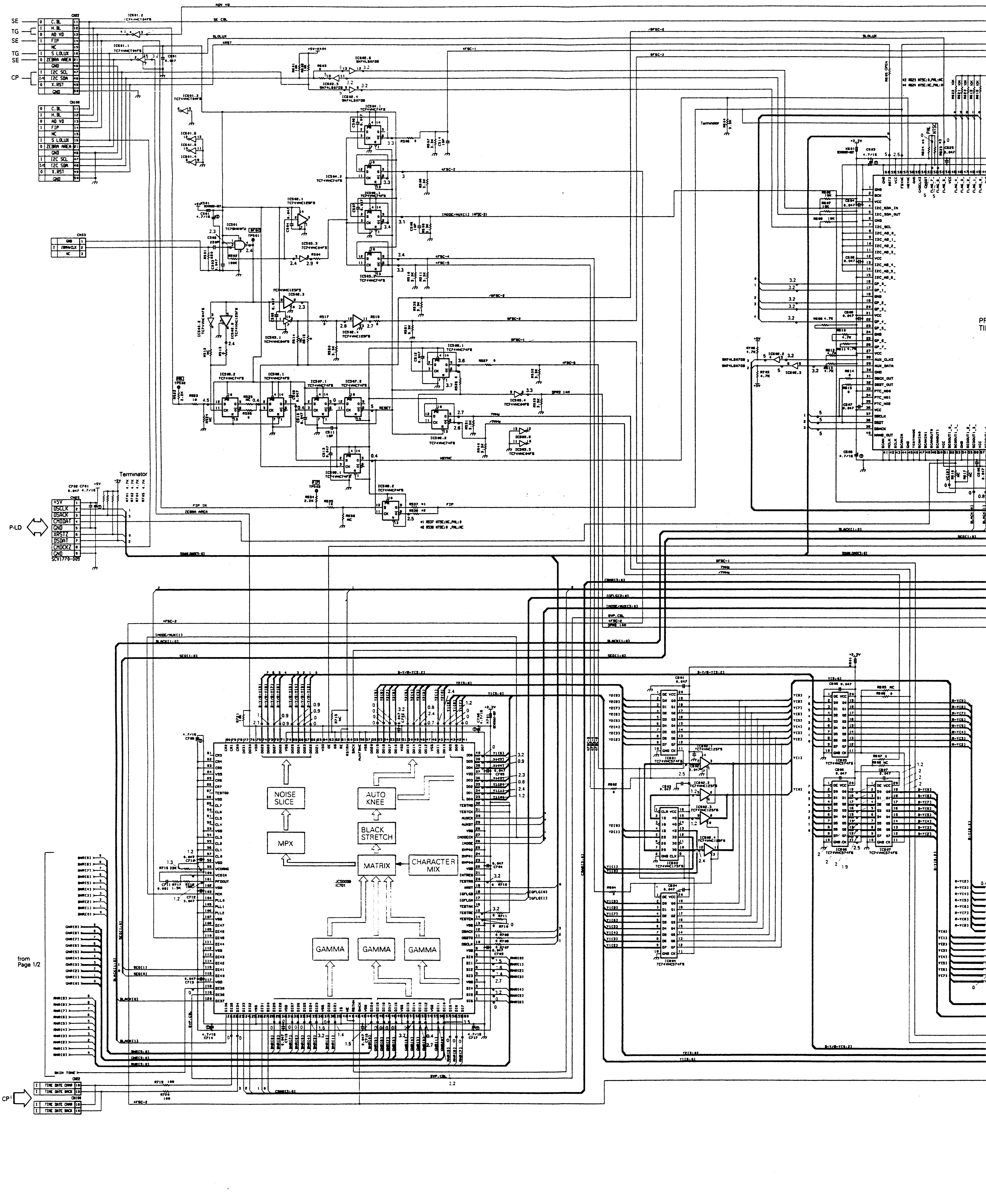
R365	A- 1A
R366	A- 1A
C1	B- 2B
C2	B- 2B
C3	A- 1B
C4	A- 2B
C5	A- 2B
C6	A- 2B
C7	A- 1B
C9	A- 1B
C103	B- 1B
C104	A- 1B
C105	A- 1B
C106	A- 1B
C112	B- 1B
C113	B- 2B
C114	B- 2A
C203	B- 1A
C204	A- 1A
C205	A- 1B
C206	A- 1A
C212	A- 1B
C213	A- 1B
C214	B- 2A
C303	A- 1A
C304	A- 1A
C305	B- 1A
C306	B- 1A
C312	A- 1A
C313	A- 1A
C314	B- 2A
TP101	A- 1A
TP102	B- 1A
TP201	A- 1A
TP202	B- 1A
TP301	A- 2A
TP302	B- 1A
CN1	A- 2B
CN3	A- 1B
CN4	A- 1B
CN5	A- 1A
CN21	A- 2B
CN36	B- 2B

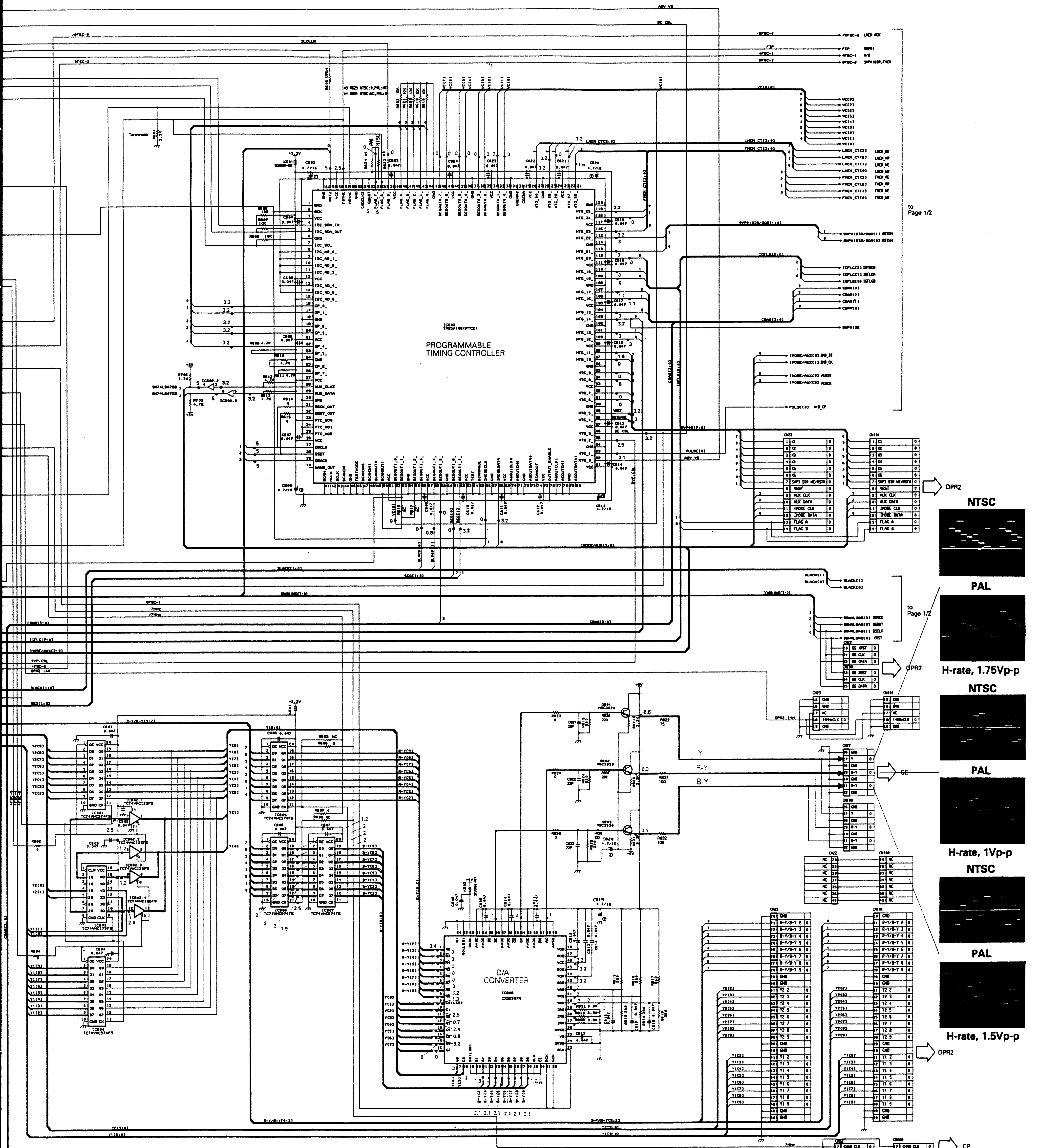
3.19 DPR1 BOARD SCHEMATIC DIAGRAM(1/2) 08


CN100
CN22
GND
TP1
+5V
+3.3V
-5V
+9V
CN1
PA
R
G
B
GND
10MHz L.P.F
LC101
LC201
LC301
SCV2824-001H
IC101
AD8011AR
IC102
LMC6082IMX
IC103
AD9820
10bit
A/D CONVERTER
IC202
AD9820
IC201
AD8011AR
IC302
IC303
AD9820
IC301
AD8011AR
Q101
3SK157
Q201
3SK157
Q301
3SK157
Q302
2SC1532
D101
D201
D301
MA142ATX
C114
C214
C314
220P
RNR[9:0]
GNR[9:0]
BNR[9:0]
R
G
B
IC401
IC402
MN47V77S
FIELD
MEMORY
IC403
MN47V77S
FIELD
MEMORY
IC404
MN47V77S
IC405
MN47V77S
IC407
HM63021
IC408
HM63021
LINE MEMORY
IC409
HM63021
LINE MEMORY
IC410
HM63021
RL
GL
BL
RF
GF
BF
WE
WR
RR
RE
BLACK[1:0]
CBAR[3:0]
VC[8:0]
FMEM_WR FMEM_CT[0]
FMEM_WE FMEM_CT[1]
FMEM_RR FMEM_CT[2]
FMEM_RE FMEM_CT[3]
LMEM_WR LMEM_CT[0]
LMEM_WE LMEM_CT[1]
LMEM_RR LMEM_CT[2]
LMEM_RE LMEM_CT[3]
VC[8]
VC[7]
VC[6]
VC[5]
VC[4]
VC[3]
VC[2]
VC[1]
VC[0]
RSTWH/WE SVP*1DIR/DOR[0]
RSTRH/RE SVP*1DIR/DOR[1]
FMEM_CT[3:0]
LMEM_CT[3:0]
VC[8:0]
SVP*1DIR/DOR[1:0]
from
Page 2/2
DSACK DOWNLOAD[3]
DSDAT DOWNLOAD[2]
DSCLK DOWNLOAD[1]
XRST DOWNLOAD[0]
DOWNLOAD[3:0]
INTREQ IGFLG[2]
IGFLGA IGFLG[1]
IGFLGB IGFLG[0]
CBAR[3]
CBAR[2]
CBAR[1]
CBAR[0]
IGFLG[2:0]
A/D_CP PULSE[0]
CBAR[3:0]
IMD_DT IMODE/AUX[0]
IMD_CK IMODE/AUX[1]
AUXDT IMODE/AUX[2]
AUXCK IMODE/AUX[3]
IMODE/AUX[3:0]
4FSC-1
4FSC-2
8FSC-2
FIP
/8FSC-2
SVP*1OE
BLACK[1:0]
CP
CN100
GND
SID CLK
SID RX
DTC END
LMEM OE
LMEM RR
AUX LD
CN22
from Page 2/2
BLACK[1]
BLACK[0]


WHITE DOTS CORRECTION
COLOR MATRIX
DIGITAL NOISE REDUCER
DETAIL CORRECTION
IC401
JCS0039
LINE MEMORY
LINE MEMORY
IC407
HM63021
IC408
HM63021
IC409
HM63021
IC410
HM63021
IC406
HM63021
SN74LS07DB
IC602.1
RL
GL
BL
RF
GF
BF
BNR[9:0]
GNR[9:0]
RNR[9:0]
VC[8:0]
BLACK[1:0]
CBAR[3:0]
SVP#1DIR/DOR[1:0]
DOWNLOAD[3:0]
IGFLG[2:0]
IMODE/AUX[3:0]
4FSC-2
8FSC-2
FIP
+5V
+3.3V
+5V-K404
SKIN TONE
BNR[9]
BNR[8]
BNR[7]
BNR[6]
BNR[5]
BNR[4]
BNR[3]
BNR[2]
BNR[1]
BNR[0]
GNR[9]
GNR[8]
GNR[7]
GNR[6]
GNR[5]
GNR[4]
GNR[3]
GNR[2]
GNR[1]
GNR[0]
RNR[9]
RNR[8]
RNR[7]
RNR[6]
RNR[5]
RNR[4]
RNR[3]
RNR[2]
RNR[1]
RNR[0]
to
Page 2/2
WE
WR
RR
RE

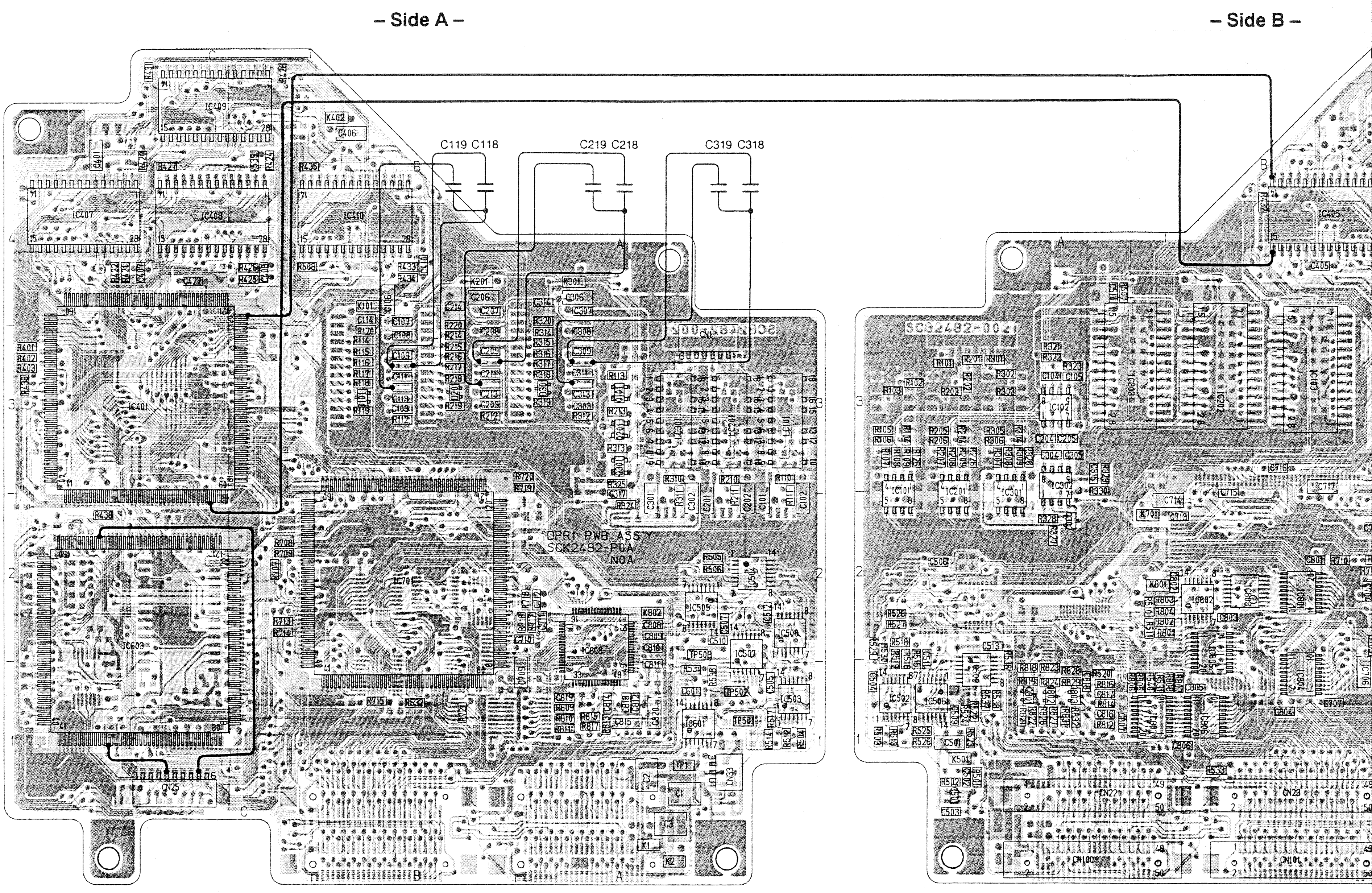
DPR1 BOARD SCHEMATIC DIAGRAM(2/2)


SE
TG
SE
TG
SE
CP
P-LD
CP
from Page 1/2
Terminator
NOISE SLICE
AUTO KNEE
BLACK STRETCH
MPX
MATRIX
CHARACTER MIX
GAMMA
GAMMA
GAMMA
JCS0039
IC701


PROGRAMMABLE
TIMING CONTROLLER
D/A
CONVERTER
Terminator
to
Page 1/2
to
Page 1/2
DPR2
DPR2
DPR2
SE
CP
Y
R-Y
B-Y
NTSC
PAL
H-rate, 1.75Vp-p
NTSC
PAL
H-rate, 1Vp-p
NTSC
PAL
H-rate, 1.5Vp-p

91136

3.20 DPR1 CIRCUIT BOARD



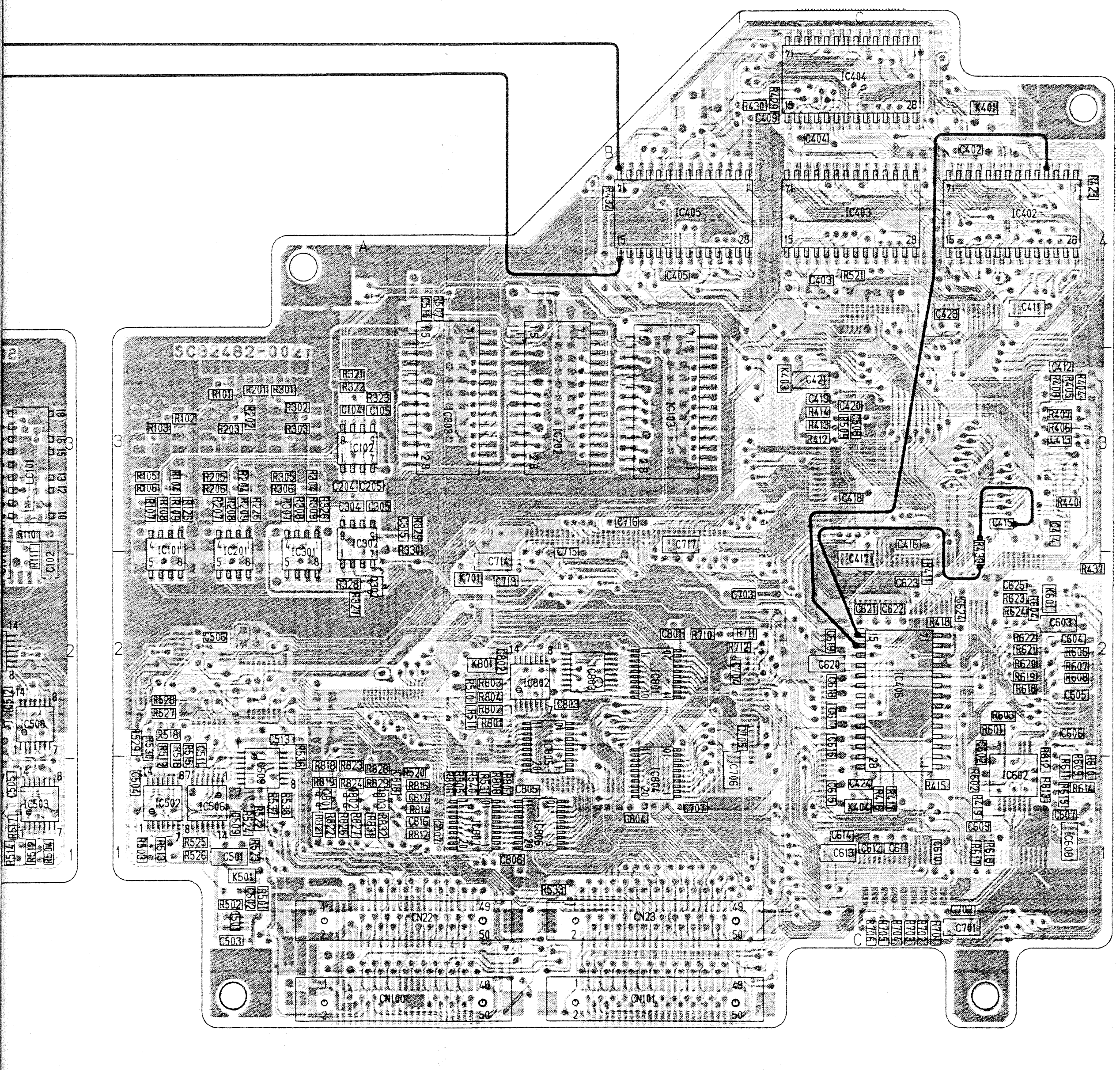
●ADDRESS TABLE OF BOARD PARTS

Each address may have an address error by one interval.

A-1C
Side —┘ └— Y axis
└— X axis

IC101	B- 2A	IC806	B- 1B	R126	B- 3A	R315	A- 3B	R423	B- 4C	R519	B- 2A	R615	B- 1C	R806	B- 1B	C109	A- 3B	C401	A- 4C	C513	
IC102	B- 3A	IC807	B- 1B	R201	B- 3A	R316	A- 3B	R424	A- 4C	R520	B- 1A	R616	B- 1C	R807	B- 1B	C110	A- 3B	C402	B- 4C	C514	
IC103	B- 3B	IC808	A- 2A	R202	B- 3A	R317	A- 3B	R425	A- 3C	R521	B- 3C	R617	B- 1C	R808	B- 1B	C111	A- 3B	C403	B- 3C	C601	
IC201	B- 2A			R203	B- 3A	R318	A- 3B	R426	A- 3C	R522	B- 1A	R618	B- 2C	R809	A- 1A	C112	A- 3B	C404	B- 4C	C602	
IC202	B- 3B	Q101	A- 3A	R204	B- 3A	R319	A- 3B	R427	A- 4C	R523	B- 1A	R619	B- 2C	R810	A- 1A	C113	A- 3B	C405	B- 3B	C603	
IC301	B- 2A	Q201	A- 3A	R205	B- 3A	R320	A- 3B	R428	A- 4C	R524	B- 1A	R620	B- 2C	R811	A- 1A	C114	A- 3B	C406	A- 4B	C604	
IC302	B- 2A	Q301	A- 3A	R206	B- 3A	R321	B- 3A	R429	B- 4C	R525	B- 1A	R621	B- 2C	R812	B- 1A	C201	A- 2A	C407	A- 3C	C605	
IC303	B- 3B	Q302	B- 2A	R207	B- 3A	R322	B- 3A	R430	B- 4B	R526	B- 1A	R622	B- 2C	R813	A- 1A	C202	A- 2A	C408	A- 3C	C606	
IC401	A- 3C	Q801	B- 1A	R208	B- 3A	R323	B- 3A	R431	A- 4C	R527	B- 2A	R623	B- 2C	R814	B- 1A	C203	A- 3B	C409	B- 4B	C607	
IC402	B- 4C	Q802	B- 1A	R209	B- 3A	R324	A- 2A	R432	B- 4B	R528	B- 2A	R624	B- 2C	R815	A- 1A	C204	B- 3A	C410	A- 3B	C608	
IC403	B- 4C	Q803	B- 1A	R210	A- 2A	R325	A- 2A	R433	A- 3B	R529	B- 2A	R701	B- 1C	R816	B- 1A	C205	B- 3A	C411	B- 3C	C609	
IC404	B- 4C			R211	A- 2A	R326	B- 3A	R434	A- 3B	R530	B- 2A	R702	B- 1C	R817	A- 1A	C206	A- 3B	C412	B- 3C	C610	
IC405	B- 4B	D101	A- 3B	R212	A- 3B	R327	B- 2A	R435	A- 4B	R531	B- 1B	R703	B- 1C	R818	B- 2A	C207	A- 3B	C413	B- 3C	C611	
IC406	B- 2C	D201	A- 3B	R213	A- 3A	R328	B- 2A	R436	A- 3C	R532	A- 1B	R704	B- 1C	R819	B- 1A	C208	A- 3B	C414	B- 2C	C612	
IC407	A- 4C	D301	A- 3B	R214	A- 3B	R329	B- 2A	R437	B- 2C	R533	B- 1B	R705	B- 1C	R821	B- 1A	C209	A- 3B	C415	B- 2C	C613	
IC408	A- 4C			R215	A- 3B	R330	B- 2A	R438	A- 2C	R534	A- 2A	R706	B- 1C	R822	B- 1A	C210	A- 3B	C416	B- 2C	C614	
IC409	A- 4C	R101	B- 3A	R216	A- 3B	R401	A- 3C	R439	B- 2C	R535	A- 1A	R707	A- 2C	R823	B- 2A	C211	A- 3B	C417	B- 2C	C615	
IC410	A- 4B	R102	B- 3A	R217	A- 3B	R402	A- 3C	R440	B- 3C	R536	B- 2A	R708	A- 2B	R824	B- 1A	C212	A- 3B	C418	B- 3C	C616	
IC501	B- 1A	R103	B- 3A	R218	A- 3B	R403	A- 3C	R501	B- 1A	R537	B- 1A	R709	A- 2B	R826	B- 1A	C213	A- 3B	C419	B- 3C	C617	
IC502	B- 1A	R104	B- 3A	R219	A- 3B	R404	B- 3C	R502	B- 1A	R538	B- 1A	R710	B- 2B	R827	B- 1A	C214	A- 3B	C420	B- 3C	C618	
IC503	A- 1A	R105	B- 3A	R220	A- 3B	R405	B- 3C	R503	B- 1A	R539	A- 4C	R711	B- 2B	R828	B- 2A	C301	A- 2A	C421	B- 3C	C619	
IC504	A- 2A	R106	B- 3A	R226	B- 3A	R406	B- 3C	R504	A- 1A	R540	B- 1B	R712	B- 2B	R829	B- 1A	C302	A- 2A	C422	A- 3C	C620	
IC505	A- 2A	R107	B- 3A	R301	B- 3A	R407	B- 3C	R505	A- 2A	R601	B- 2C	R713	A- 2C	R831	B- 1A	C303	A- 3A	C423	B- 3C	C621	
IC506	B- 1A	R108	B- 3A	R302	B- 3A	R408	B- 3C	R506	A- 2A	R602	B- 1C	R714	A- 2C	R832	B- 1A	C304	B- 3A	C424	B- 1C	C622	
IC507	A- 2A	R109	B- 3A	R303	B- 3A	R411	B- 2C	R507	B- 3A	R603	B- 2C	R715	A- 1B			C305	B- 3A	C501	B- 1A	C623	
IC508	A- 2A	R110	A- 2A	R304	B- 3A	R412	B- 3C	R508	A- 3B	R604	B- 2C	R716	A- 2B	C1	A- 1A	C306	A- 3A	C502	B- 1A	C624	
IC509	B- 2A	R111	A- 2A	R305	B- 3A	R413	B- 3C	R509	B- 3C	R605	A- 1B	R717	A- 2B	C2	A- 1A	C307	A- 3A	C503	B- 1A	C625	
IC601	A- 1A	R112	A- 3B	R306	B- 3A	R414	B- 3C	R510	B- 2B	R606	B- 2C	R718	A- 2B	C3	A- 1A	C308	A- 3A	C504	B- 1A	C701	
IC602	B- 1C	R113	A- 3A	R307	B- 3A	R415	B- 1C	R511	B- 2B	R607	B- 2C	R719	A- 2B	C101	A- 2A	C309	A- 3A	C505	A- 1A	C702	
IC603	A- 2C	R114	A- 3B	R308	B- 3A	R416	B- 1C	R512	A- 1A	R608	B- 2C	R720	A- 2B	C102	A- 2A	C310	A- 3A	C506	B- 2A	C703	
IC701	A- 2B	R115	A- 3B	R309	B- 3A	R417	B- 1C	R513	B- 1A	R609	B- 2C	R721	A- 1B	C103	A- 3B	C311	A- 3A	C507	A- 2A	C704	
IC801	B- 2B	R116	A- 3B	R310	A- 2A	R418	B- 2C	R514	A- 1A	R610	B- 2C	R801	B- 2B	C104	B- 3A	C312	A- 3A	C508	B- 3C	C705	
IC802	B- 2B	R117	A- 3B	R311	A- 2A	R419	B- 1C	R515	B- 2A	R611	B- 2C	R802	B- 2B	C105	B- 3A	C313	A- 3A	C509	B- 1A	C706	
IC803	B- 2B	R118	A- 3B	R312	A- 3A	R420	A- 4C	R516	B- 2A	R612	B- 2C	R803	B- 2B	C106	A- 3B	C314	A- 3B	C510	A- 2A	C707	
IC804	B- 1B	R119	A- 3B	R313	A- 3A	R421	A- 3C	R517	A- 1A	R613	B- 1C	R804	B- 2B	C107	A- 3B	C315	B- 2A	C511	B- 2A	C709	
IC805	B- 2B	R120	A- 3B	R314	A- 3B	R422	A- 3C	R518	B- 2A	R614	B- 1C	R805	B- 1B	C108	A- 3B	C317	A- 2A	C512	A- 2A	C710	

– Side B –



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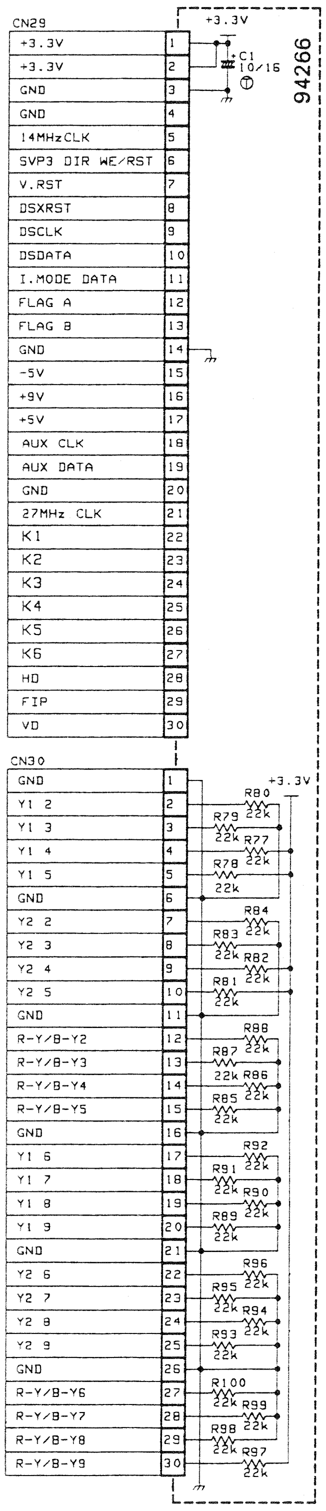
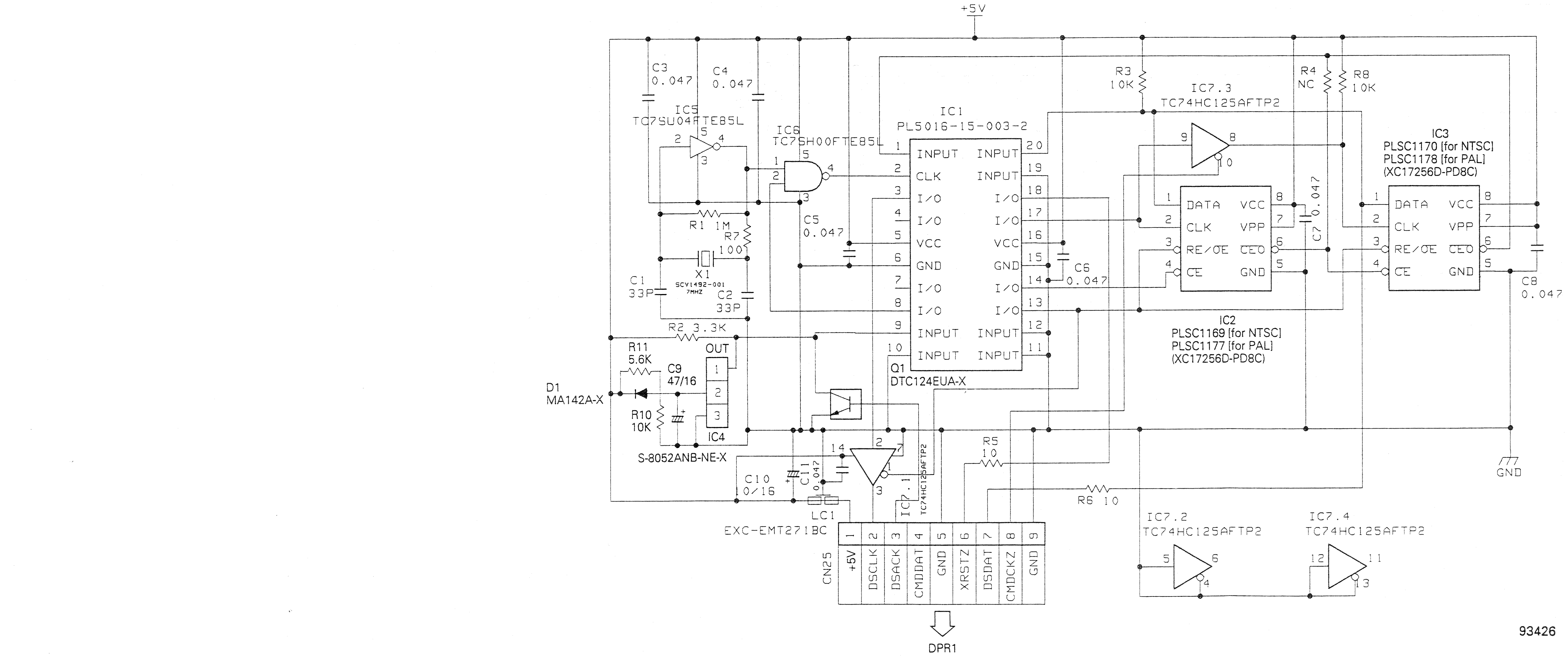
B- 1A	R616	B- 1C	R807	B- 1B	C110	A- 3B	C402	B- 4C	C514	B- 3A	C712	A- 2B	K301	A- 3A
B- 3C	R617	B- 1C	R808	B- 1B	C111	A- 3B	C403	B- 3C	C601	A- 1A	C713	B- 2B	K401	B- 4C
B- 1A	R618	B- 2C	R809	A- 1A	C112	A- 3B	C404	B- 4C	C602	B- 2C	C714	B- 2B	K402	A- 4B
B- 1A	R619	B- 2C	R810	A- 1A	C113	A- 3B	C405	B- 3B	C603	B- 2C	C715	B- 2B	K403	B- 3C
B- 1A	R620	B- 2C	R811	A- 1A	C114	A- 3B	C406	A- 4B	C604	B- 2C	C716	B- 2B	K404	B- 1C
B- 1A	R621	B- 2C	R812	B- 1A	C201	A- 2A	C407	A- 3C	C605	B- 2C	C717	B- 2B	K501	B- 1A
B- 1A	R622	B- 2C	R813	A- 1A	C202	A- 2A	C408	A- 3C	C606	B- 2C	C801	B- 2B	K601	B- 2C
B- 2A	R623	B- 2C	R814	B- 1A	C203	A- 3B	C409	B- 4B	C607	B- 1C	C802	B- 2B	K701	B- 2B
B- 2A	R624	B- 2C	R815	A- 1A	C204	B- 3A	C410	A- 3B	C608	B- 1C	C803	B- 2B	K801	B- 2B
B- 2A	R701	B- 1C	R816	B- 1A	C205	B- 3A	C411	B- 3C	C609	B- 1C	C804	B- 1B	K802	A- 2A
B- 2A	R702	B- 1C	R817	A- 1A	C206	A- 3B	C412	B- 3C	C610	B- 1C	C805	B- 1B		
B- 1B	R703	B- 1C	R818	B- 2A	C207	A- 3B	C413	B- 3C	C611	B- 1C	C806	B- 1B	LC101	A- 3A
A- 1B	R704	B- 1C	R819	B- 1A	C208	A- 3B	C414	B- 2C	C612	B- 1C	C807	B- 1A	LC201	A- 3A
B- 1B	R705	B- 1C	R821	B- 1A	C209	A- 3B	C415	B- 2C	C613	B- 1C	C808	A- 2A	LC301	A- 3A
A- 2A	R706	B- 1C	R822	B- 1A	C210	A- 3B	C416	B- 2C	C614	B- 1C	C809	A- 2A		
A- 1A	R707	A- 2C	R823	B- 2A	C211	A- 3B	C417	B- 2C	C615	B- 1C	C810	A- 2A	CN1	A- 3A
B- 2A	R708	A- 2B	R824	B- 1A	C212	A- 3B	C418	B- 3C	C616	B- 2C	C811	A- 2A	CN22	B- 1A
B- 1A	R709	A- 2B	R826	B- 1A	C213	A- 3B	C419	B- 3C	C617	B- 2C	C812	A- 1A	CN23	B- 1B
B- 1A	R710	B- 2B	R827	B- 1A	C214	A- 3B	C420	B- 3C	C618	B- 2C	C813	A- 1A	CN25	A- 1C
A- 4C	R711	B- 2B	R828	B- 2A	C301	A- 2A	C421	B- 3C	C619	B- 2C	C814	A- 1A	CN33	A- 1A
B- 1B	R712	B- 2B	R829	B- 1A	C302	A- 2A	C422	A- 3C	C620	B- 2C	C815	A- 1A	CN100	B- 1A
B- 2C	R713	A- 2C	R831	B- 1A	C303	A- 3A	C423	B- 3C	C621	B- 2C	C816	B- 1A	CN101	B- 1B
B- 1C	R714	A- 2C	R832	B- 1A	C304	B- 3A	C424	B- 1C	C622	B- 2C	C817	B- 1A		
B- 2C	R715	A- 1B			C305	B- 3A	C501	B- 1A	C623	B- 2C	C818	B- 1A		
B- 2C	R716	A- 2B	C1	A- 1A	C306	A- 3A	C502	B- 1A	C624	B- 2C	C819	A- 1A		
A- 1B	R717	A- 2B	C2	A- 1A	C307	A- 3A	C503	B- 1A	C625	B- 2C	C820	A- 1A		
B- 2C	R718	A- 2B	C3	A- 1A	C308	A- 3A	C504	B- 1A	C701	B- 1C				
B- 2C	R719	A- 2B	C101	A- 2A	C309	A- 3A	C505	A- 1A	C702	B- 1C	TP1	A- 1A		
B- 2C	R720	A- 2B	C102	A- 2A	C310	A- 3A	C506	B- 2A	C703	B- 2B	TP501	A- 1A		
B- 2C	R721	A- 1B	C103	A- 3B	C311	A- 3A	C507	A- 2A	C704	B- 2B	TP502	A- 1A		
B- 2C	R801	B- 2B	C104	B- 3A	C312	A- 3A	C508	B- 3C	C705	B- 2B	TP503	A- 2A		
B- 2C	R802	B- 2B	C105	B- 3A	C313	A- 3A	C509	B- 1A	C706	B- 2B				
B- 2C	R803	B- 2B	C106	A- 3B	C314	A- 3B	C510	A- 2A	C707	B- 1B	K1	A- 1A		
B- 1C	R804	B- 2B	C107	A- 3B	C315	B- 2A	C511	B- 2A	C709	A- 2B	K2	A- 1A		
B- 1C	R805	B- 1B	C108	A- 3B	C317	A- 2A	C512	A- 2A	C710	A- 2B	K101	A- 3B		

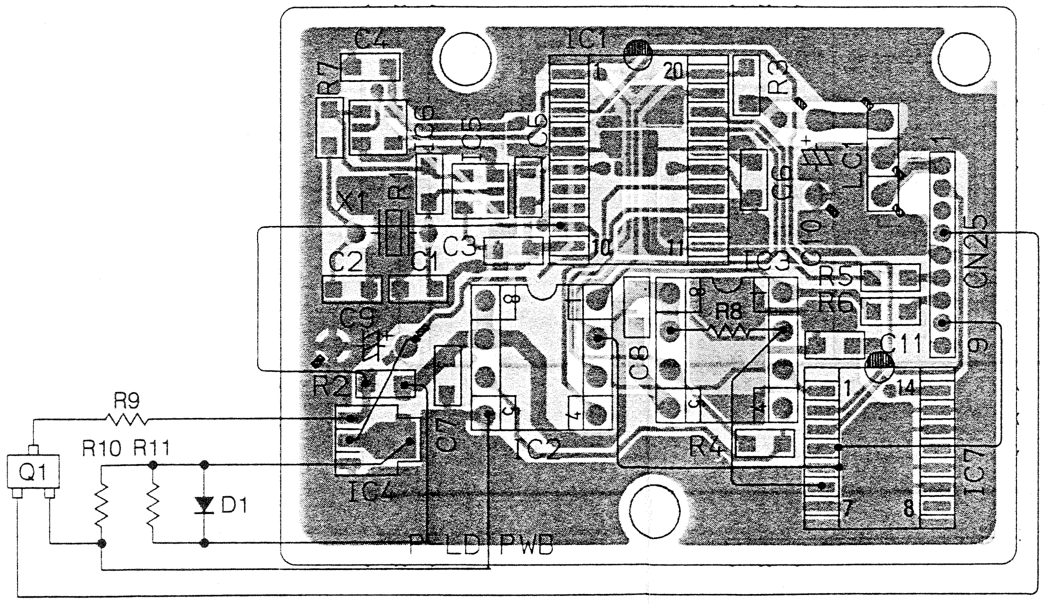
3.21 DPR2 BOARD SCHEMATIC DIAGRAM 09


CN29
+3.3V
+3.3V
GND
GND
14MHzCLK
SVP3 DIR WE/RST
V.RST
DSXRST
DSCLK
DSDATA
I.MODE DATA
FLAG A
FLAG B
GND
-5V
+9V
+5V
AUX CLK
AUX DATA
GND
27MHz CLK
K1
K2
K3
K4
K5
K6
HD
FIP
VD
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
+3.3V
C1
10/16
94266
CN30
GND
Y1 2
Y1 3
Y1 4
Y1 5
GND
Y2 2
Y2 3
Y2 4
Y2 5
GND
R-Y/B-Y2
R-Y/B-Y3
R-Y/B-Y4
R-Y/B-Y5
GND
Y1 6
Y1 7
Y1 8
Y1 9
GND
Y2 6
Y2 7
Y2 8
Y2 9
GND
R-Y/B-Y6
R-Y/B-Y7
R-Y/B-Y8
R-Y/B-Y9
+3.3V
R80 22k
R79 22k
R77 22k
R78 22k
R84 22k
R83 22k
R82 22k
R81 22k
R88 22k
R87 22k
R86 22k
R85 22k
R92 22k
R91 22k
R90 22k
R89 22k
R96 22k
R95 22k
R94 22k
R93 22k
R100 22k
R99 22k
R98 22k
R97 22k

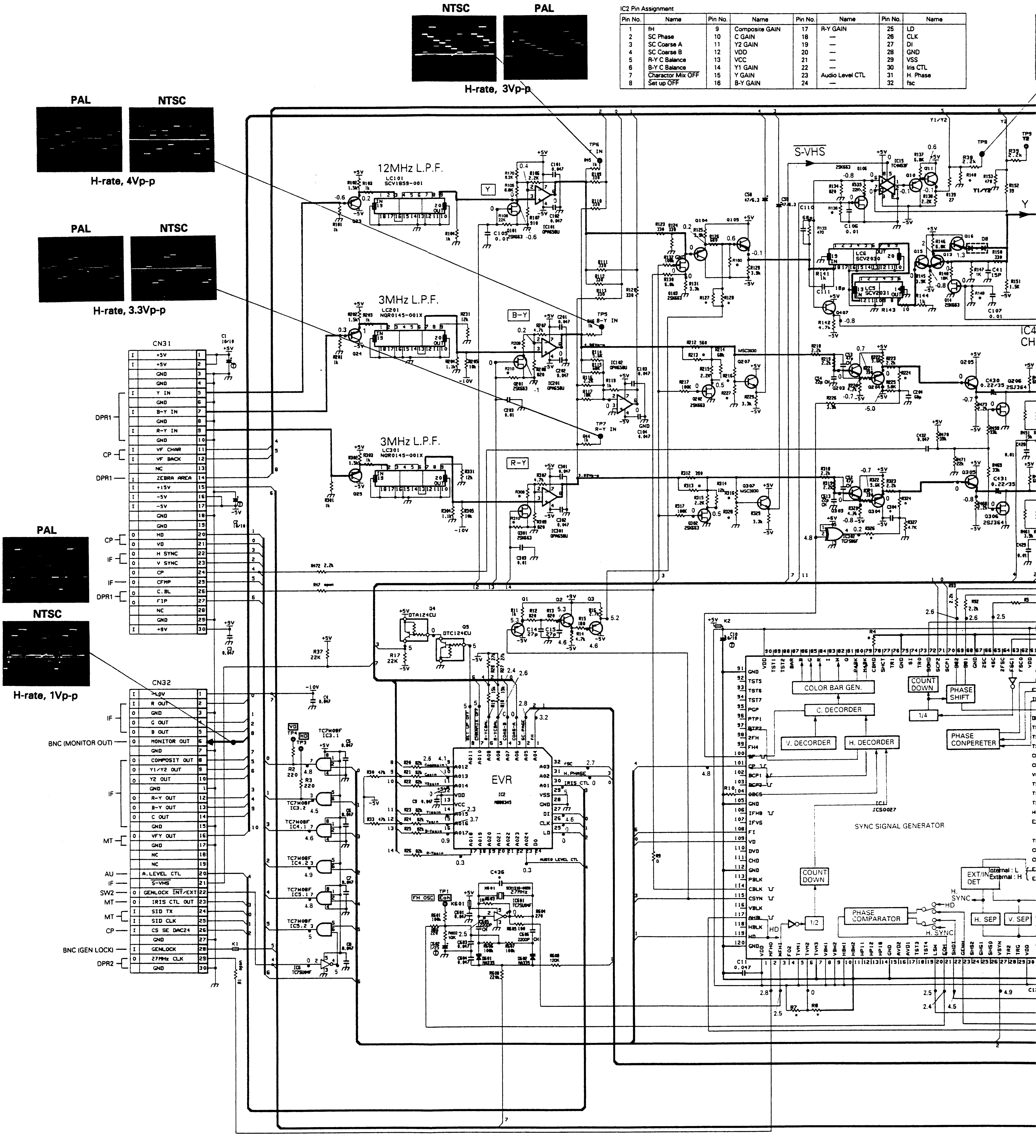
3.22 P-LD BOARD SCHEMATIC DIAGRAM 1 0


+5V
C3 0.047
C4 0.047
IC5 TC7SU04FTE85L
IC6 TC7SH00FTE85L
IC1 PL5016-15-003-2
INPUT
CLK
I/O
VCC
GND
R1 1M
R7 100
X1 SCV1492-001 7MHZ
C1 33P
C2 33P
C5 0.047
C6 0.047
C7 0.047
C8 0.047
R2 3.3K
R11 5.6K
C9 47/16
OUT
IC4 S-8052ANB-NE-X
D1 MA142A-X
R10 10K
Q1 DTC124EUA-X
C10 10/16
C11 0.047
LC1 EXC-EMT271BC
IC7.1 TC74HC125AFTP2
R3 10K
R4 NC
R8 10K
R5 10
R6 10
IC7.3 TC74HC125AFTP2
IC7.2 TC74HC125AFTP2
IC7.4 TC74HC125AFTP2
IC2 PLSC1169 [for NTSC] PLSC1177 [for PAL] (XC17256D-PD8C)
IC3 PLSC1170 [for NTSC] PLSC1178 [for PAL] (XC17256D-PD8C)
DATA
CLK
RE/OE
CE
VCC
VPP
CEO
GND
CN25
+5V
DSCLK
DSACK
CMDDAT
GND
XRSTZ
DSDAT
CMDCKZ
GND
DPR1
93426

3.23 P-LD CIRCUIT BOARD


C4
R7
IC1
20
R3
IC6
IC5
C6
C5
LC1
X1
R1
C2
C1
C3
C10
IC3
R5
R6
CN25
C9
R8
C8
C11
R2
R9
R10 R11
Q1
D1
IC4
C7
IC2
R4
IC7
14
1
7
8
9
P-LD PWB

3.24 SE BOARD SCHEMATIC DIAGRAM 1/1

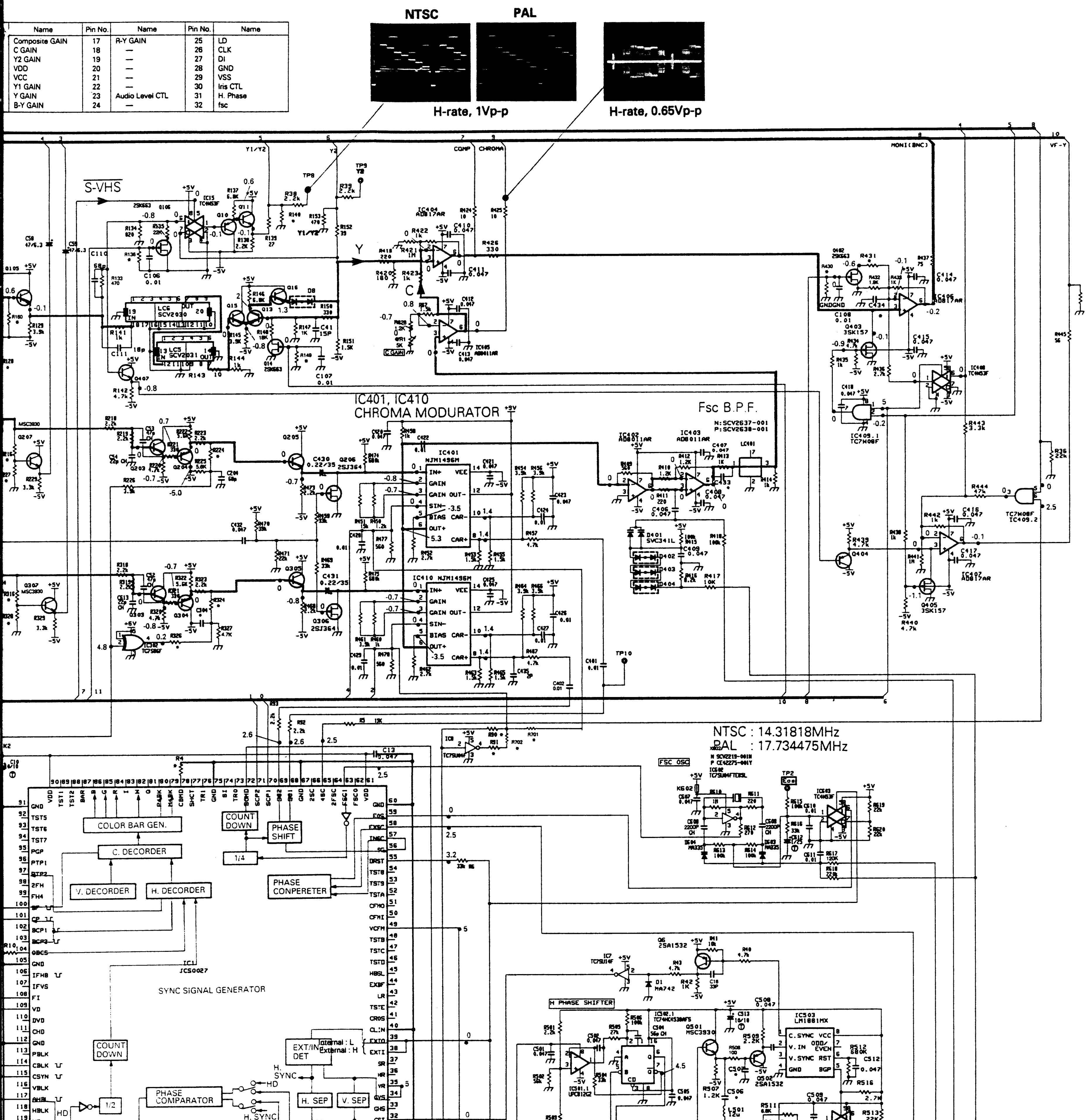

NTSC
PAL
H-rate, 3Vp-p
PAL
NTSC
H-rate, 4Vp-p
PAL
NTSC
H-rate, 3.3Vp-p
PAL
NTSC
H-rate, 1Vp-p
12MHz L.P.F.
LC101
SCV1859-001
3MHz L.P.F.
LC201
NQR0145-001X
3MHz L.P.F.
LC301
NQR0145-001X
Y
B-Y
R-Y
TP6
Y IN
TP5
B-Y IN
TP7
R-Y IN
S-VHS
Y1/Y2
TP8
TP9
CN31
+5V
+5V
GND
GND
Y IN
GND
B-Y IN
GND
R-Y IN
GND
VF CHAR
VF BACK
NC
ZEBRA AREA
+15V
-5V
-5V
GND
GND
HD
VD
H SYNC
V SYNC
CP
CFMP
C.BL
FIP
NC
GND
+9V
DPR1
CP
DPR1
CP
IF
IF
DPR1
CN32
-10V
R OUT
GND
G OUT
B OUT
MONITOR OUT
GND
COMPOSIT OUT
Y1/Y2 OUT
Y2 OUT
GND
R-Y OUT
B-Y OUT
C OUT
GND
VFY OUT
GND
NC
NC
A.LEVEL CTL
S-VHS
GENLOCK INT/EXT
IRIS CTL OUT
SID TX
SID CLK
CS SE DAC24
GND
GENLOCK
27MHz CLK
GND
IF
BNC (MONITOR OUT)
IF
MT
AU
IF
SW2
MT
MT
CP
BNC (GEN LOCK)
DPR2
EVR
IC2
TC7W08F
IC3.1
IC3.2
IC4.1
IC4.2
IC5.1
IC5.2
IC6
TC7SU04F
DTA124EU
DTC124EU
FH OSC
27MHz
AUDIO LEVEL CTL
IRIS CTL
H.PHASE
fsc
VD
HD
TP1
TP3
TP4
COLOR BAR GEN.
C. DECORDER
V. DECORDER
H. DECORDER
COUNT DOWN
PHASE SHIFT
1/4
PHASE CONPERETER
IC1
JCS0027
SYNC SIGNAL GENERATOR
COUNT DOWN
1/2
PHASE COMPARATOR
H. SEP
V. SEP
H. SYNC
H. SYNC
EXT/INT DET
Internal : L
External : H
LC6
SCV2020
LC5
SCV2031
IC15
IC4
CH

IC2 Pin Assignment

Pin No.	Name	Pin No.	Name	Pin No.	Name	Pin No.	Name
1	fH	9	Composite GAIN	17	R-Y GAIN	25	LD
2	SC Phase	10	C GAIN	18	—	26	CLK
3	SC Coarse A	11	Y2 GAIN	19	—	27	DI
4	SC Coarse B	12	VDD	20	—	28	GND
5	R-Y C Balance	13	VCC	21	—	29	VSS
6	B-Y C Balance	14	Y1 GAIN	22	—	30	Iris CTL
7	Charactor Mix OFF	15	Y GAIN	23	Audio Level CTL	31	H. Phase
8	Set up OFF	16	B-Y GAIN	24	—	32	fsc

•	R4	R7	R90	R91	R127	R128	R136	R140	R149	R160	R209	R210	R213	R216
NTSC	1M	0	15K	15K	27K	6.8K	15K	560	15K	27K	5.6K	15K	33K	100
PAL	0	1M	180K	330K	56K	5.6K	22K	560	22K	22K	8.2K	22K	3.9K	150

Name	Pin No.	Name	Pin No.	Name
Composite GAIN	17	R-Y GAIN	25	LD
C GAIN	18	—	26	CLK
Y2 GAIN	19	—	27	DI
VDD	20	—	28	GND
VCC	21	—	29	VSS
Y1 GAIN	22	—	30	Iris CTL
Y GAIN	23	Audio Level CTL	31	H. Phase
B-Y GAIN	24	—	32	fsc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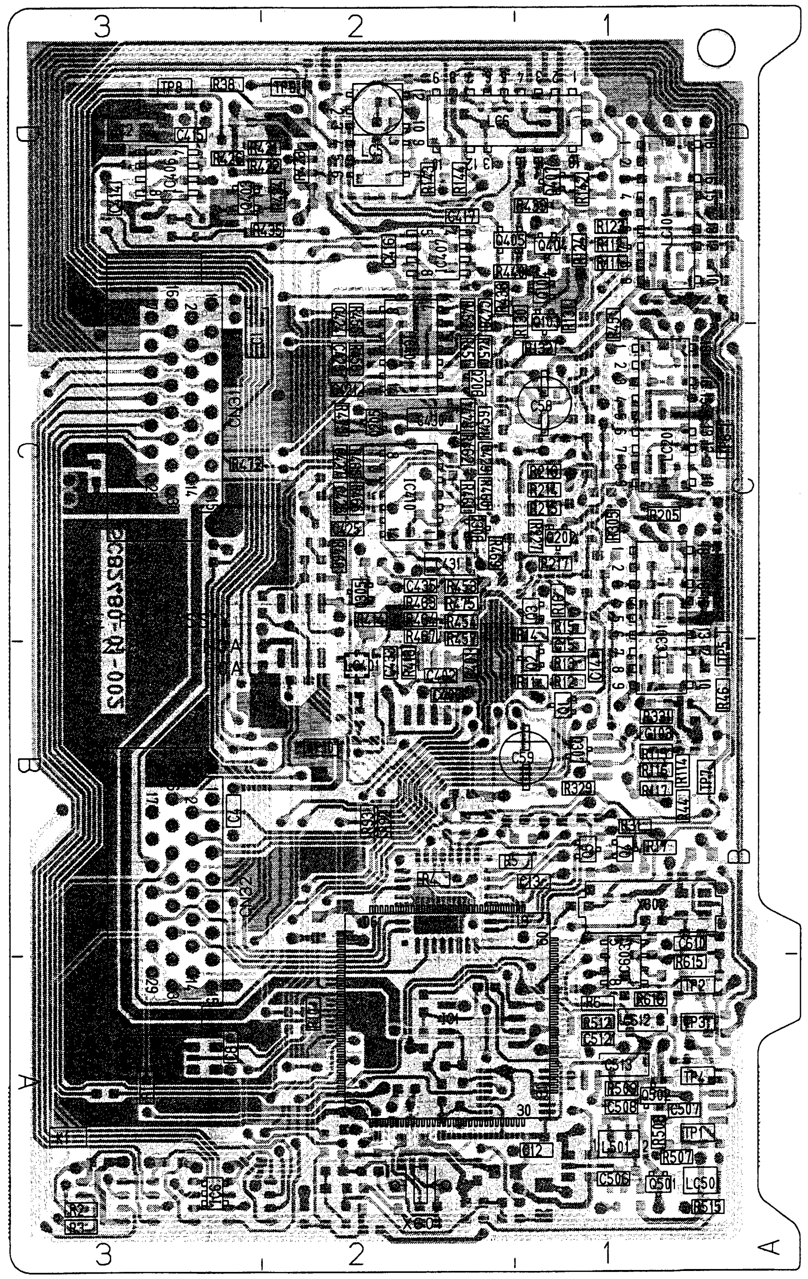
PAL
H-rate, 1Vp-p
H-rate, 0.65Vp-p
S-VHS
Y1/Y2
TP8
TP9
Y
C
C GAIN
IC404 AD817AR
IC405 AD811AR
MONI (BNC)
VF-Y
IC401, IC410
CHROMA MODURATOR
IC401 NJM1496M
IC410 NJM1496M
Fsc B.P.F.
N: SCV2637-001
P: SCV2638-001
IC402 AD811AR
IC403 AD811AR
IC406 AD817AR
IC407 AD817AR
TC7W08F IC409.1
TC7W08F IC409.2
NTSC : 14.31818MHz
PAL : 17.734475MHz
FSC OSC
TP2
TP10
COLOR BAR GEN.
C. DECORDER
V. DECORDER
H. DECORDER
COUNT DOWN
PHASE SHIFT
1/4
PHASE CONPERETER
IC1 ICS0027
SYNC SIGNAL GENERATOR
EXT/INT DET
Internal : L
External : H
H. SYNC
HD
H. SEP
V. SEP
PHASE COMPARATOR
1/2
H PHASE SHIFTER
IC503 LM1881MX
C. SYNC
V. IN
ODD/EVEN
V. SYNC
RST
GND
BGP
IC504 AD811AR
IC505 TC4053F
LC501 SCV2597-S144Z

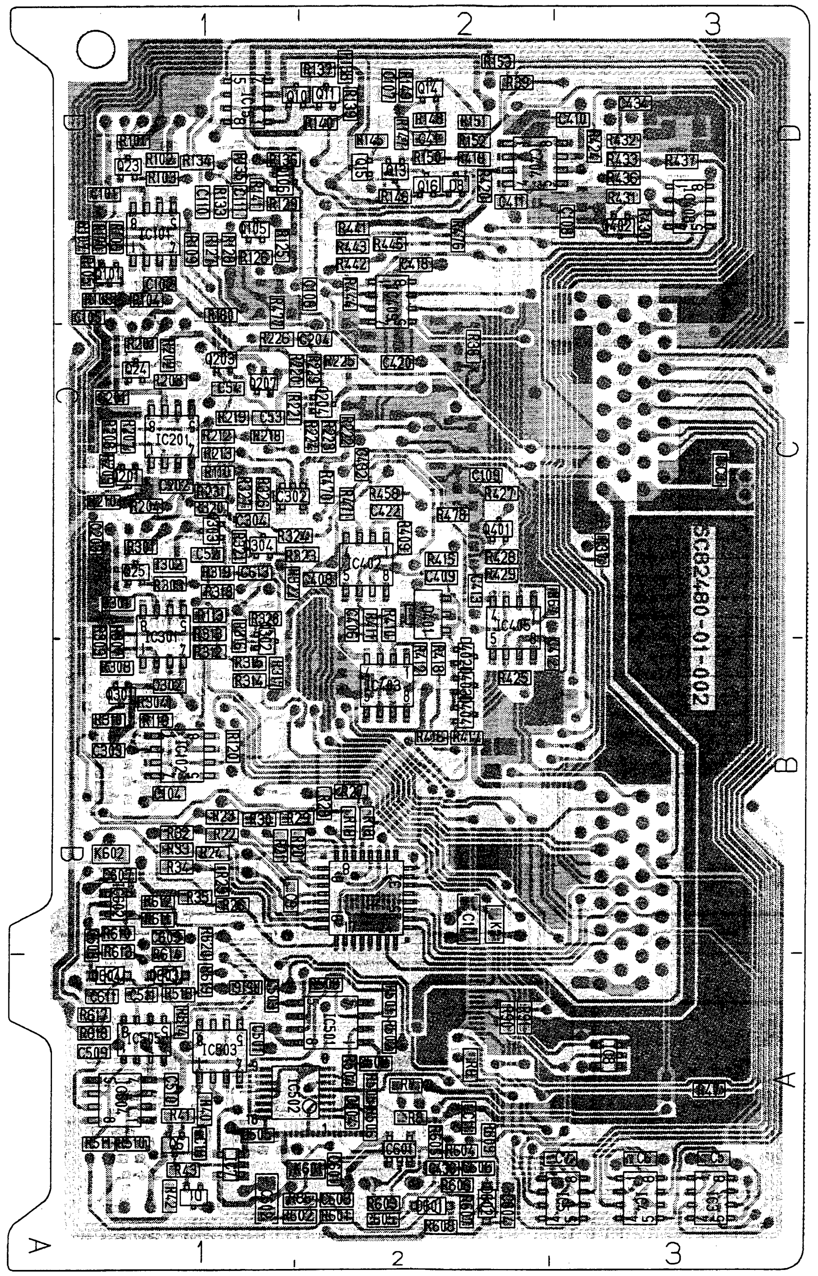
•	R4	R7	R90	R91	R127	R128	R136	R140	R149	R160	R209	R210	R213	R216	R224	R227	R308	R310	R313	R324	R326	R328	R429	R430	R431	R432	R701	R702	C304	C433	C434	C436	C506	C507
NTSC	1M	0	15K	15K	27K	6.8K	15K	560	15K	27K	5.6K	15K	33K	100	15K	150	5.6K	15K	15K	22K	OPEN	150	OPEN	15K	8.2K	1.8K	OPEN	0	OPEN	22P	12P	18P	150P	OPEN
PAL	0	1M	180K	330K	56K	5.6K	22K	560	22K	22K	8.2K	22K	3.9K	150	18K	100	8.2K	22K	2.7K	22K	4.7K	100	15K	22K	15K	15K	0	OPEN	0	15P	9P	OPEN	120P	OPEN

3.25 SE CIRCUIT BOARD

– Side A –

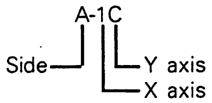


– Side B –



●ADDRESS TABLE OF BOARD PARTS

Each address may have an address error by one interval.



IC1	A-2A
IC2	B-2B
IC3	B-3A
IC4	B-3A
IC5	B-3A
IC6	A-3A
IC7	B-1A
IC8	B-3A
IC15	B-1D
IC101	B-1D
IC102	B-1B
IC201	B-1C
IC301	B-1C
IC302	B-1C
IC401	A-2C
IC402	B-2C
IC403	B-2B
IC404	B-2D
IC405	B-2C
IC406	A-3D
IC407	A-2D
IC408	B-3D
IC409	B-2D
IC410	A-2C
IC501	B-2A
IC502	B-1A
IC503	B-1A
IC504	B-1A
IC505	B-1A
IC601	B-2A
IC602	B-1B
IC603	A-1A
Q1	A-1B
Q2	A-1B
Q3	A-1C
Q4	A-1B
Q5	A-1B
Q6	B-1A
Q10	B-1D
Q11	B-2D
Q13	B-2D
Q14	B-2D
Q15	B-2D
Q16	B-2D
Q23	B-1D
Q24	B-1C
Q25	B-1C
Q101	B-1D
Q103	A-1D
Q104	A-1D
Q105	B-1D
Q106	B-1D
Q201	B-1C
Q202	A-1C
Q203	B-1C
Q204	B-2C
Q205	A-2C
Q206	A-2C
Q207	B-1C
Q301	B-1B
Q302	B-1B
Q303	B-1C
Q304	B-1C
Q305	A-2C
Q306	A-2C
Q307	A-1B
Q401	B-2C
Q402	B-3D
Q403	A-3D
Q404	A-1D
Q405	A-2D
Q407	A-1D
Q501	A-1A
Q502	A-1A
D1	B-1A
D8	B-2D
D401	B-2C
D402	B-2B
D403	B-2B
D404	B-2B
D601	B-2A
D602	B-2A
D603	B-1A
D604	B-1A
R1	A-3A
R2	A-3A
R3	A-3A
R4	A-2B
R5	A-1B
R6	A-1A
R7	B-2A
R8	B-2A
R9	B-2A
R10	A-2A
R11	A-1B
R12	A-1B
R13	A-1B
R14	A-1C
R15	A-1C
R16	A-1C
R17	A-1B
R18	B-2B
R19	B-2B
R20	B-2B
R21	B-1B
R22	B-1B
R23	B-1B
R24	B-1B
R25	B-1B
R26	B-1B
R27	B-2B
R28	B-2B
R29	B-1B
R30	B-1B
R31	A-1B
R32	B-1B
R33	B-1B
R34	B-1B
R35	B-1B
R36	B-2C
R37	B-3C
R38	A-3D
R39	B-2D
R40	B-1A
R41	B-1A
R42	B-1A
R43	B-1A
R44	A-1B
R45	A-1C
R46	A-1B
R47	B-3A
R67	B-2C
R86	B-2A
R90	B-2A
R91	B-2A
R92	A-2B
R93	A-2B
R101	B-1D
R102	B-1D
R103	B-1D
R104	B-1D
R105	B-1D
R106	B-1D
R107	B-1D
R108	B-1D
R109	B-1D
R110	B-1C
R111	A-1D
R112	A-1D
R113	B-1C
R114	A-1B
R115	A-1B
R116	A-1B
R117	A-1B
R119	B-1B
R120	B-1B
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R125	B-1D
R126	B-1D
R127	B-1D
R128	B-1D
R129	B-1D
R130	A-1D
R131	A-1D
R132	A-1C
R133	B-1D
R134	B-1D
R135	B-1D
R136	B-1D
R137	B-2D
R138	B-2D
R139	B-2D
R140	B-2D
R141	B-1D
R142	A-1D
R143	A-2D
R144	A-2D
R145	B-2D
R146	B-2D
R147	B-2D
R148	B-2D
R149	B-2D
R150	B-2D
R151	B-2D
R152	B-2D
R153	B-2D
R160	B-1D
R170	B-1D
R201	B-1C
R202	B-1C
R203	B-1C
R204	B-1C
R205	A-1C
R207	B-1C
R208	B-1C
R209	B-1C
R210	B-1C
R212	B-1C
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R218	B-1C
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R221	B-1C
R222	B-2C
R223	B-2C
R224	B-2C
R225	B-2C
R226	B-1C
R227	A-1C
R229	B-2C
R231	B-1C
R301	B-1C
R302	B-1C
R303	B-1C
R304	B-1B
R305	A-1C
R307	B-1B
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R316	B-1C
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R414	A-2C
R415	B-2C
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R442	B-2D
R443	B-2D
R444	B-2D
R445	B-2D
R450	A-2C
R451	A-2C
R452	A-2D
R453	A-2C
R454	A-2C
R455	A-2D
R456	A-2C
R457	A-2C
R458	B-2C
R459	A-2C
R460	A-2C
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R604	B-2A
R605	B-2A
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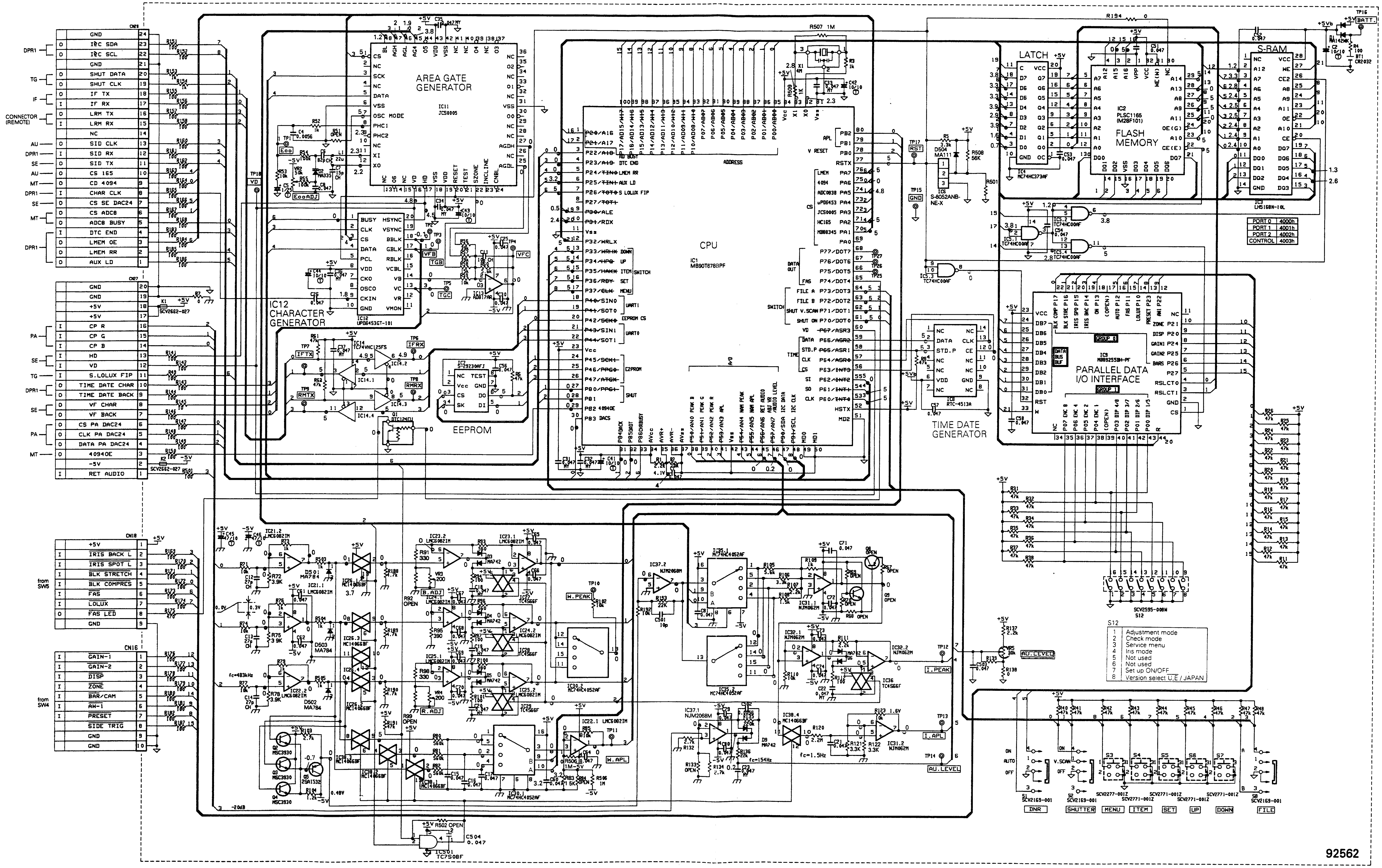
R608	B-2A
R609	B-2A
R610	B-1B
R611	B-1B
R612	B-1B
R613	B-1B
R614	B-1B
R615	A-1A
R616	A-1A
R617	B-1A
R618	B-1A
R619	B-1A
R620	B-1B
C1	A-3C
C2	A-3D
C3	B-3C
C4	A-3B
C5	B-3A
C6	B-3A
C7	B-3A
C8	A-3A
C9	B-1B
C10	B-2B
C11	B-2A
C12	A-1A
C13	A-1B
C14	A-1B
C15	A-1B
C16	B-1A
C41	B-2D
C52	B-1C
C53	B-1C
C54	B-1C
C58	A-1C
C59	A-1B
C101	B-1D
C102	B-1D
C103	A-1B
C104	B-1B
C105	B-1D
C106	B-2D
C107	B-2D
C108	B-3D
C109	B-2C
C110	B-1D
C111	B-1D
C201	B-1C
C202	B-1C
C203	B-1C
C204	B-2C
C301	B-1C
C302	B-1B
C303	B-1B
C304	B-1C
C401	A-2B
C402	A-2B
C406	B-2C
C407	A-2B
C408	B-2C
C409	B-2C
C410	B-3D
C411	B-2D
C412	B-2B
C413	B-2C
C414	A-3D
C415	A-3D
C416	A-2D
C417	A-2D
C418	B-2D
C420	B-2C
C421	A-2C
C422	B-2C
C423	A-2C
C424	A-2D
C425	A-2C
C426	A-2C
C427	A-2C
C428	A-2D
C429	A-2C
C430	A-2C
C431	A-2C
C432	B-2C
C433	A-2B
C434	B-3D
C435	A-2C
C436	B-2A
C501	B-1A
C502	B-2A
C503	B-1A
C504	B-2A
C505	B-1A
C506	A-1A
C507	A-1A
C508	A-1A
C509	B-1A
C510	B-1A
C511	B-1A
C512	A-1A
C513	A-1A
C601	B-2A
C602	B-1A
C603	B-2A
C604	B-2A
C605	B-2A
C606	B-2A
C607	B-1B
C608	B-1B
C609	B-1B
C610	A-1B
C611	B-1A
C612	A-1A
C613	B-1C
L501	A-1A
TP1	A-1A
TP2	A-1A
TP3	A-1A
TP4	A-1A
TP5	A-1B
TP6	A-1C
TP7	A-1B
TP8	A-3D
TP9	A-2D
TP10	A-2B
CN31	A-3D
CN32	A-3B
K1	A-3A
K2	B-2B
K601	B-2A
K602	B-1B
LC5	A-2D
LC6	A-2D
LC101	A-1D
LC201	A-1C
LC301	A-1C
LC401	A-2B
LC501	A-1A
X601	A-2A
X602	A-1B

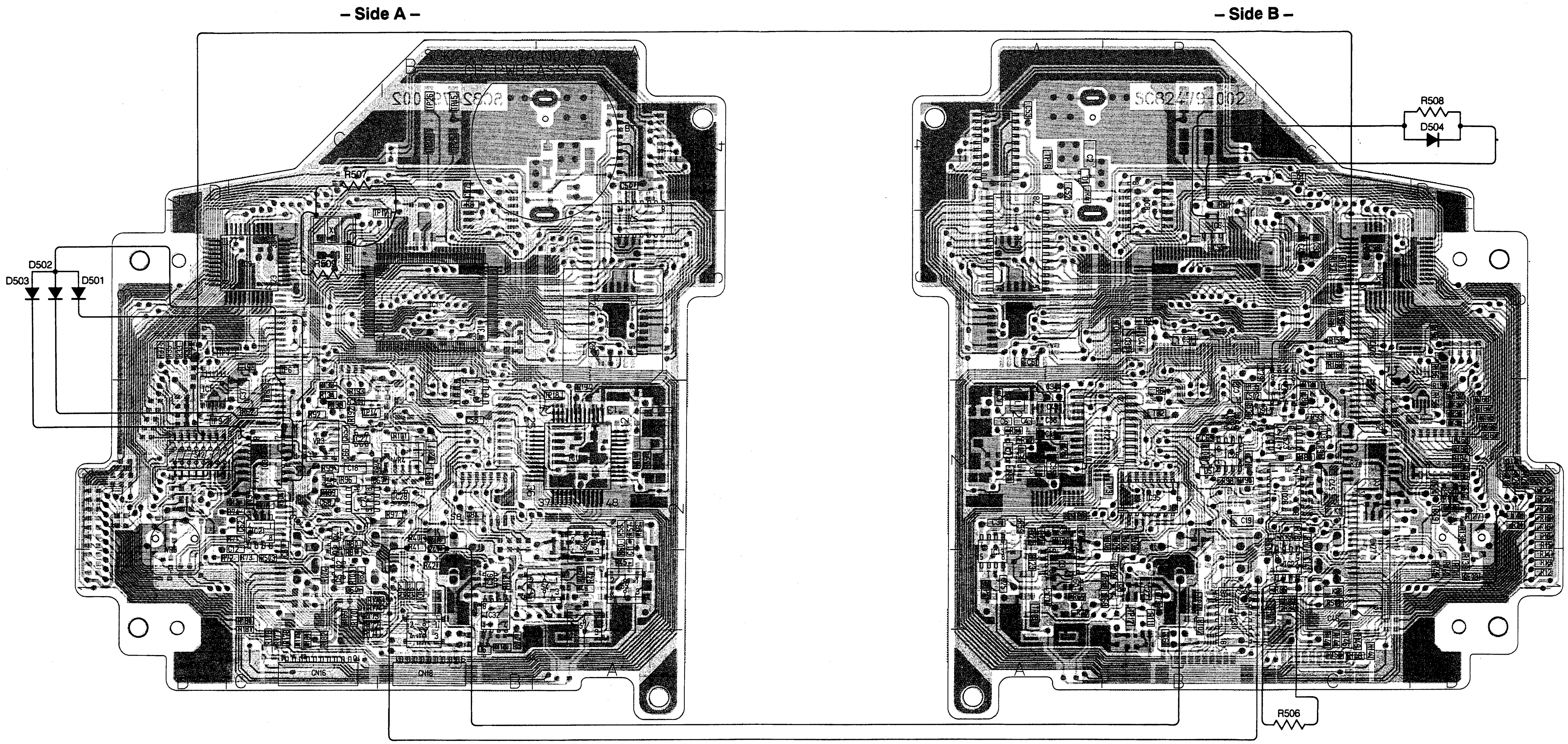
3.26 CP BOARD SCHEMATIC DIAGRAM 1 2


AREA GATE GENERATOR
IC11 JCS0005
IC12 CHARACTER GENERATOR
UPD6453GT-101
EEPROM
CPU
IC1 MB90T678BPF
LATCH
IC4 MC74HC373AF
IC2 PLSC1165 (M28F101)
FLASH MEMORY
S-RAM
IC3 LH5168N-10L
PORT 0 4000h
PORT 1 4001h
PORT 2 4002h
CONTROL 4003h
PARALLEL DATA I/O INTERFACE
IC9 MB89255BN-PF
TIME DATE GENERATOR
IC8 RTC-4513A
CONNECTOR (REMOTE)
from SW5
from SW4
SCV2595-008W
S12
S12
1 Adjustment mode
2 Check mode
3 Service menu
4 Iris mode
5 Not used
6 Not used
7 Set up ON/OFF
8 Version select U,E / JAPAN
DNR
SHUTTER
MENU
ITEM
SET
UP
DOWN
FILE
W.PEAK
W.APL
I.PEAK
I.APL
AU.LEVEL
92562

IC30, IC35

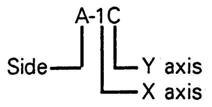
CONTROL INPUT		ON CHANNEL
A	B	
L	L	1, 12
L	H	5, 14
H	L	2, 15
H	H	4, 11

3.27 CP CIRCUIT BOARD



●ADDRESS TABLE OF BOARD PARTS

Each address may have an address error by one interval.



IC1	A- 3B
IC2	A- 3A
IC3	B- 4A
IC4	B- 4A
IC5	A- 4A
IC6	B- 4B
IC7	A- 2B
IC8	B- 4B
IC9	A- 3C
IC11	A- 2A
IC12	B- 2B
IC13	B- 2A
IC14	A- 3D
IC21	A- 2C
IC22	B- 1C
IC23	B- 2C
IC24	A- 2C
IC25	B- 2B
IC26	B- 2C
IC27	A- 2C
IC28	A- 2B
IC29	B- 2B
IC30	B- 1B
IC31	B- 1A
IC32	A- 1B
IC35	B- 2B
IC36	A- 1B
IC37	B- 3C
IC38	A- 2C
IC501	B- 2D
Q1	B- 4C
Q2	A- 1C
Q3	A- 2C
Q4	A- 2C
Q5	A- 1C
Q8	B- 1B
Q9	B- 1A
D1	B- 4A
D2	B- 2A
D3	B- 2C
D4	A- 2C
D5	B- 2B
D6	A- 1B
D9	B- 2C
R1	B- 3B
R2	B- 3B
R3	A- 3C
R4	B- 4A
R5	B- 4B
R6	B- 3B
R7	B- 2C
R8	A- 4B
R11	B- 2D
R12	B- 1D
R13	B- 1D
R14	B- 2D
R15	B- 2D
R16	B- 2D
R17	B- 2D
R18	B- 2D
R19	B- 2D
R20	B- 2D
R21	B- 2D
R22	B- 2D
R23	B- 2D
R24	B- 2D
R25	B- 2D
R26	B- 2D
R31	A- 3D
R32	B- 3D
R33	A- 3D
R34	B- 2D
R35	A- 3D
R36	B- 2D
R37	A- 3D
R38	B- 2D
R40	A- 2B
R41	A- 2B
R42	A- 1B
R43	A- 1A
R44	A- 1A
R45	A- 1A
R46	A- 1A
R47	A- 2B
R48	A- 2B
R49	B- 2D
R51	A- 2A
R52	B- 2A
R53	B- 2A
R54	B- 2A
R55	A- 2A
R56	A- 2A
R57	A- 2A
R58	A- 2A
R59	B- 2A
R60	A- 2A
R61	A- 3C
R62	A- 2C
R67	B- 1B
R68	B- 1B
R69	B- 1A
R70	B- 1A
R71	A- 2C
R72	A- 2D
R73	A- 2C
R74	A- 2C
R75	A- 2C
R76	A- 2C
R77	B- 2C
R78	B- 2C
R79	B- 2C
R80	A- 2C
R81	A- 2C
R82	A- 1C
R83	B- 1C
R84	B- 1C
R85	B- 1C
R91	B- 2C
R92	A- 2C
R93	B- 2C
R94	A- 2C
R95	A- 2C
R96	A- 2C
R97	A- 2B
R98	B- 2B
R99	A- 2B
R100	B- 2B
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R102	B- 1B
R103	A- 1C
R104	A- 1C
R105	B- 2B
R106	B- 2B
R107	B- 2B
R108	B- 2B
R109	B- 1B
R110	A- 1B
R111	B- 1B
R112	A- 1B
R120	B- 2A
R121	B- 2A
R122	B- 2A
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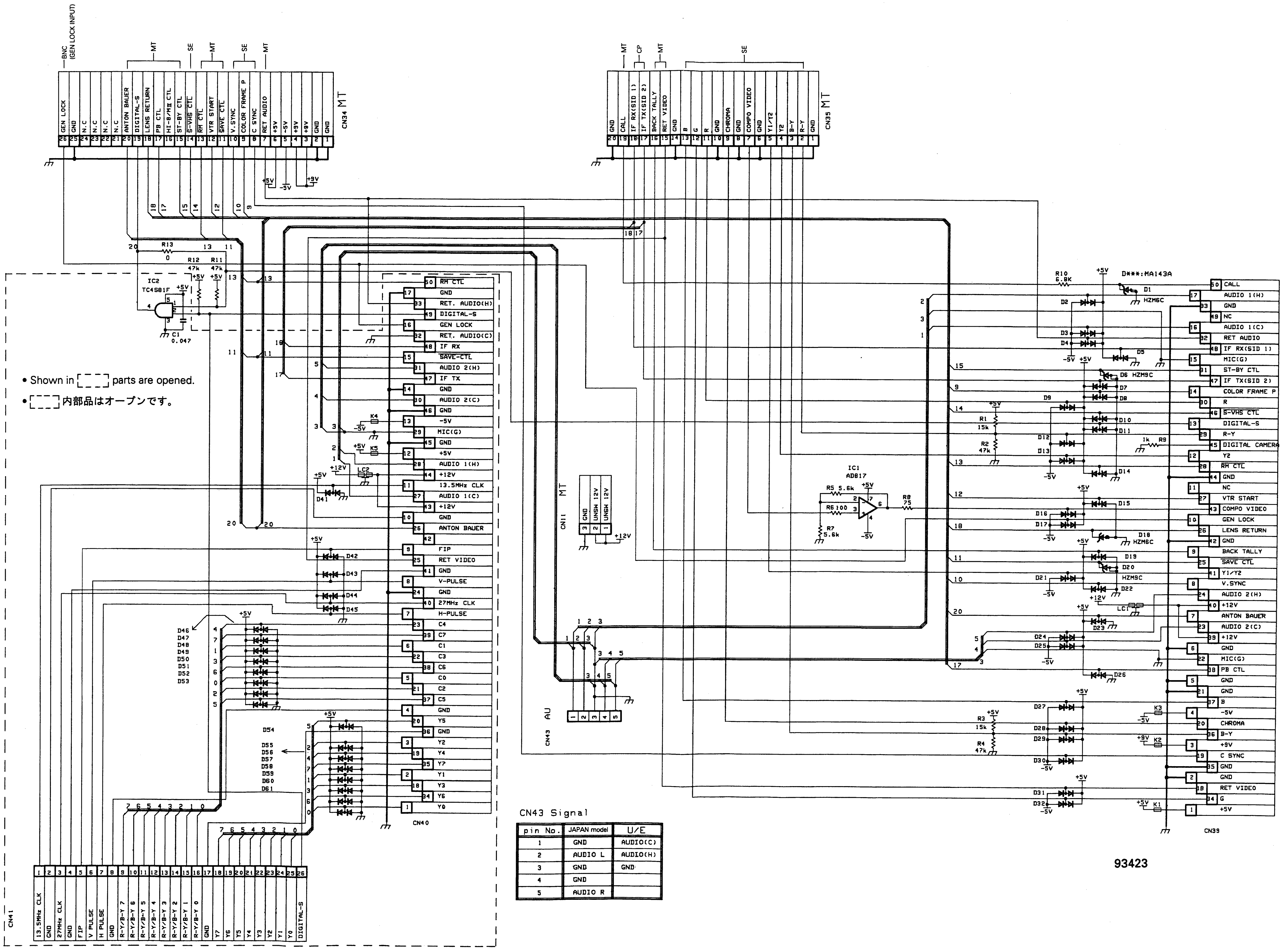
R131	B- 3C
R132	A- 3C
R133	A- 2C
R134	A- 3C
R135	B- 3B
R136	B- 2B
R137	B- 2D
R138	B- 2D
R139	B- 1D
R141	B- 1D
R142	B- 1D
R143	B- 1C
R144	B- 1C
R145	B- 1D
R146	B- 1C
R147	B- 1C
R148	B- 1C
R149	B- 1C
R150	B- 1C
R151	B- 3C
R152	B- 3C
R153	B- 3C
R154	B- 3D
R155	B- 3D
R156	B- 3D
R157	B- 3D
R158	B- 2D
R159	B- 3C
R160	B- 3C
R161	B- 3C
R162	B- 3C
R163	B- 2D
R164	B- 2D
R165	B- 2D
R166	B- 2D
R167	B- 2D
R168	B- 2D
R169	A- 1C
R170	A- 1C
R171	A- 1C
R172	A- 1C
R173	A- 1C
R174	A- 1C
R175	A- 1C
R176	A- 1C
R177	A- 1C
R178	A- 1C
R179	A- 1C
R180	A- 1C
R181	A- 1C
R182	A- 1C
R183	B- 2D
R184	B- 2D
R185	B- 2D
R186	B- 2D
R187	A- 1C
R188	B- 2C
R189	A- 2C
R190	B- 2B
R191	B- 2D
R192	A- 2C
R193	A- 3C
R194	A- 3A
R501	B- 1C
R502	B- 2D
R503	A- 2C
R504	A- 2C
R505	B- 2C
VR2	A- 2A
VR3	A- 2C
VR4	A- 2B
VR5	A- 2D
C1	B- 3B
C2	B- 4A
C4	B- 2A
C5	B- 2A
C6	B- 2A
C7	B- 2A
C8	B- 2A
C11	A- 2A
C12	A- 2C
C13	A- 2C
C14	B- 1C
C15	A- 1B
C16	A- 1B
C17	A- 1B
C18	A- 2C
C19	B- 2B
C20	A- 2B
C21	B- 2A
C22	B- 1B
C23	B- 3B
C25	B- 1A
C26	B- 2A
C30	B- 2A
C31	B- 3B
C32	B- 3B
C33	B- 3C
C34	B- 3A
C35	B- 2A
C36	B- 2A
C37	A- 3C
C41	B- 3B
C42	B- 3C
C43	B- 2A
C44	B- 2A
C45	B- 2C
C46	B- 1C
C51	B- 3A
C52	B- 4A
C53	B- 4A
C54	A- 4A
C55	B- 3B
C56	A- 2B
C57	A- 4B
C58	B- 3C
C60	B- 1B
C61	A- 2C
C62	A- 2C
C64	A- 1C
C65	A- 2C
C66	A- 2C
C67	A- 2C
C68	A- 2C
C69	B- 2B
C70	B- 2B
C71	B- 1A
C72	B- 2A
C73	B- 1B
C74	A- 1B
C79	B- 3C
C80	B- 2C
C81	A- 2B
C501	A- 2C
C502	B- 3B
C503	B- 1D
C504	B- 2D
L1	B- 2A
TP1	A- 2A
TP2	B- 2B
TP3	B- 2B
TP4	B- 1A
TP5	B- 2A
TP6	A- 3C
TP7	A- 3D
TP8	A- 3C
TP9	A- 2D
TP10	B- 1B
TP11	B- 1C
TP12	B- 1B
TP13	B- 1A
TP14	A- 2C
TP15	A- 4B
TP16	B- 4A
TP17	A- 4C
TP18	A- 3A
TP25	A- 4B
TP26	A- 4B
TP27	A- 4B
CN16	A- 1C
CN18	A- 1B
CN27	B- 2C
CN28	B- 3C
K1	B- 2C
K2	B- 1C
S1	A- 2C
S2	A- 2B
S3	A- 1B
S4	A- 1A
S5	A- 1A
S6	A- 2A
S7	A- 1A
S8	A- 2B
S12	A- 2D
BT1	A- 4A
X1	A- 4C

3.28 IF BOARD SCHEMATIC DIAGRAM 1|3


BNC (GEN LOCK INPUT)
MT
SE
CP
CN34 MT
26 GEN LOCK
25 GND
24 N.C
23 N.C
22 N.C
21 N.C
20 ANTON BAUER
19 DIGITAL-S
18 LENS RETURN
17 PB CTL
16 HI-8/MII CTL
15 ST-BY CTL
14 S-VHS CTL
13 RM CTL
12 VTR START
11 SAVE CTL
10 V.SYNC
9 COLOR FRAME P
8 C SYNC
7 RET AUDIO
6 +5V
5 -5V
4 +9V
3 +8V
2 GND
1 GND
CN35 MT
20 GND
19 CALL
18 IF RX(SID 1)
17 IF TX(SID 2)
16 BACK TALLY
15 RET VIDEO
14 GND
13 B
12 G
11 R
10 GND
9 CHROMA
8 GND
7 COMPO VIDEO
6 GND
5 Y1/Y2
4 Y2
3 B-Y
2 R-Y
1 GND
IC2 TC4S81F
R13 0
R12 47k
R11 47k
C1 0.047
+5V
-5V
+9V
+12V
K4
K5
LC2
D41
D42
D43
D44
D45
D46 D47 D48 D49 D50 D51 D52 D53
D54
D55 D56 D57 D58 D59 D60 D61
CN40
50 RM CTL
17 GND
33 RET. AUDIO(H)
49 DIGITAL-S
16 GEN LOCK
32 RET. AUDIO(C)
48 IF RX
15 SAVE-CTL
31 AUDIO 2(H)
47 IF TX
14 GND
30 AUDIO 2(C)
46 GND
13 -5V
29 MIC(G)
45 GND
12 +5V
28 AUDIO 1(H)
44 +12V
11 13.5MHz CLK
27 AUDIO 1(C)
43 +12V
10 GND
26 ANTON BAUER
42
9 FIP
25 RET VIDEO
41 GND
8 V-PULSE
24 GND
40 27MHz CLK
7 H-PULSE
23 C4
39 C7
6 C1
22 C3
38 C6
5 C0
21 C2
37 C5
4 GND
20 Y5
36 GND
3 Y2
19 Y4
35 Y7
2 Y1
18 Y3
34 Y6
1 Y0
CN41
1 13.5MHz CLK
2 GND
3 27MHz CLK
4 GND
5 FIP
6 V PULSE
7 H PULSE
8 GND
9 R-Y/B-Y 7
10 R-Y/B-Y 6
11 R-Y/B-Y 5
12 R-Y/B-Y 4
13 R-Y/B-Y 3
14 R-Y/B-Y 2
15 R-Y/B-Y 1
16 R-Y/B-Y 0
17 GND
18 Y7
19 Y6
20 Y5
21 Y4
22 Y3
23 Y2
24 Y1
25 Y0
26 DIGITAL-S
CN11 MT
3 GND
2 UNSW 12V
1 UNSW 12V
CN43 AU
1 2 3 4 5
IC1 AD817
R5 5.6k
R6 100
R7 5.6k
R8 75
R1 15k
R2 47k
R3 15k
R4 47k
R9 1k
R10 6.8K
D***:MA143A
D1 HZM6C
D6 HZM9C
D18 HZM6C
D20 HZM9C
LC1
K1
K2
K3
CN39
50 CALL
17 AUDIO 1(H)
33 GND
49 NC
16 AUDIO 1(C)
32 RET AUDIO
48 IF RX(SID 1)
15 MIC(G)
31 ST-BY CTL
47 IF TX(SID 2)
14 COLOR FRAME P
30 R
46 S-VHS CTL
13 DIGITAL-S
29 R-Y
45 DIGITAL CAMERA
12 Y2
28 RM CTL
44 GND
11 NC
27 VTR START
43 COMPO VIDEO
10 GEN LOCK
26 LENS RETURN
42 GND
9 BACK TALLY
25 SAVE CTL
41 Y1/Y2
8 V.SYNC
24 AUDIO 2(H)
40 +12V
7 ANTON BAUER
23 AUDIO 2(C)
39 +12V
6 GND
22 MIC(G)
38 PB CTL
5 GND
21 GND
37 B
4 -5V
20 CHROMA
36 B-Y
3 +9V
19 C SYNC
35 GND
2 GND
18 RET VIDEO
34 G
1 +5V

- Shown in [- - -] parts are opened.
- [- - -] 内部品はオープンです。

CN43 Signal

pin No.	JAPAN model	U/E
1	GND	AUDIO(C)
2	AUDIO L	AUDIO(H)
3	GND	GND
4	GND	
5	AUDIO R	

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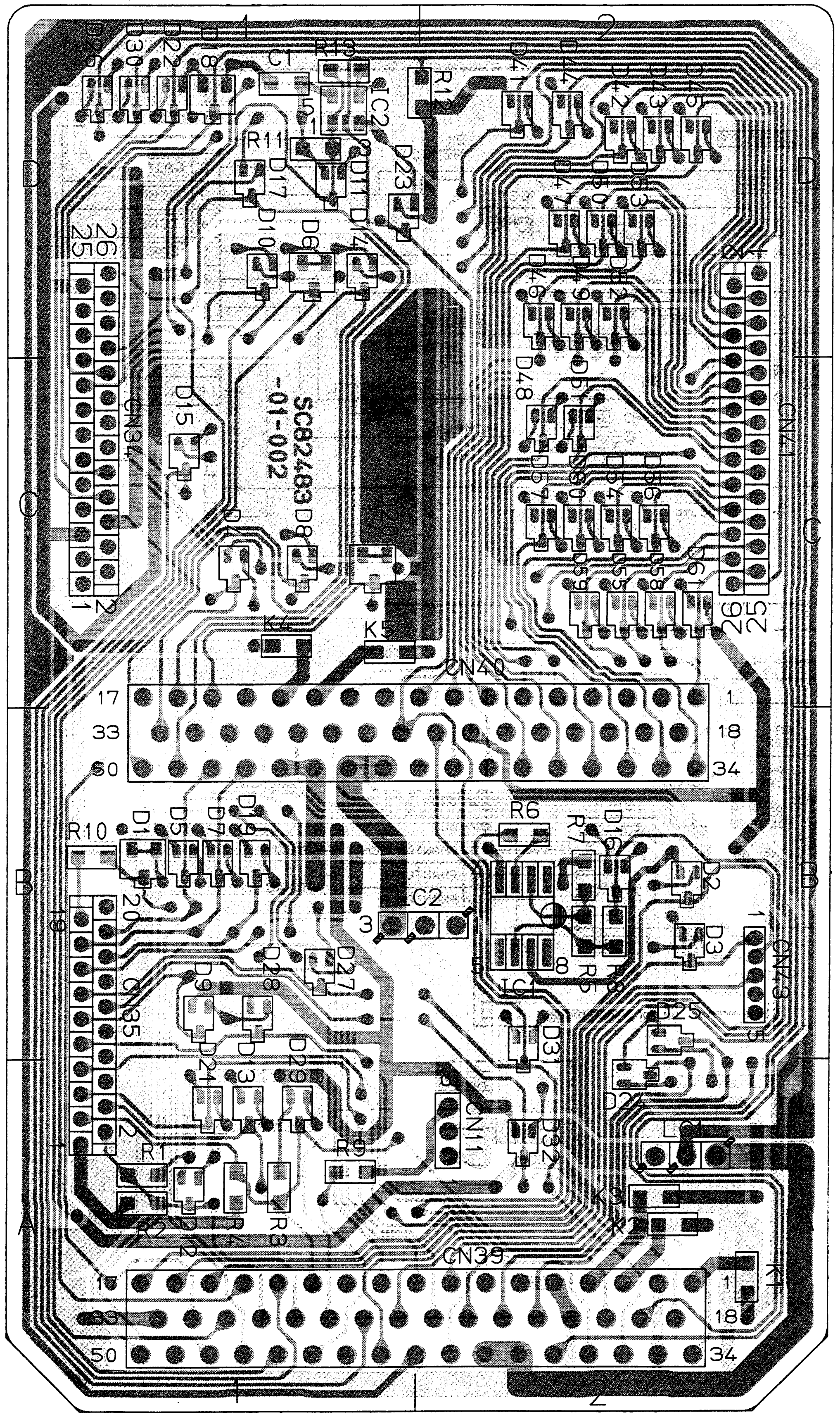
3.29 IF CIRCUIT BOARD


1
2
D
C
B
A
CN34
CN35
CN39
CN40
CN41
CN43
CN11
IC1
IC2
C1
C2
R1
R2
R3
R6
R7
R9
R10
R11
R13
K1
K2
K3
K4
K5
SC82483D8
-01-002
17
33
50
18
34
25
26

●ADDRESS TABLE OF BOARD PARTS

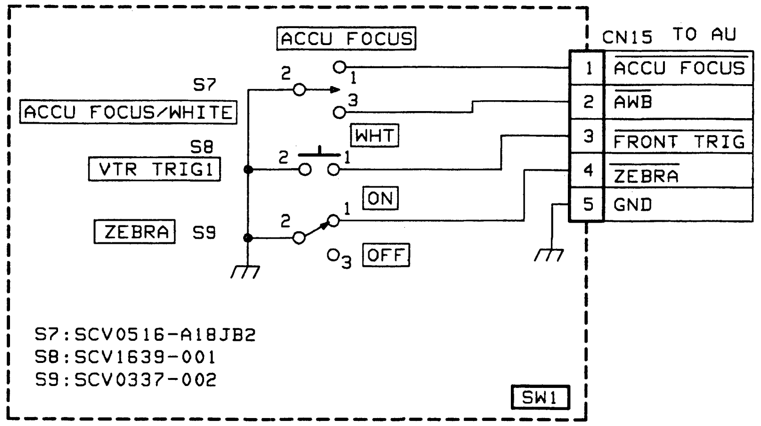
Each address may have an address error by one interval.

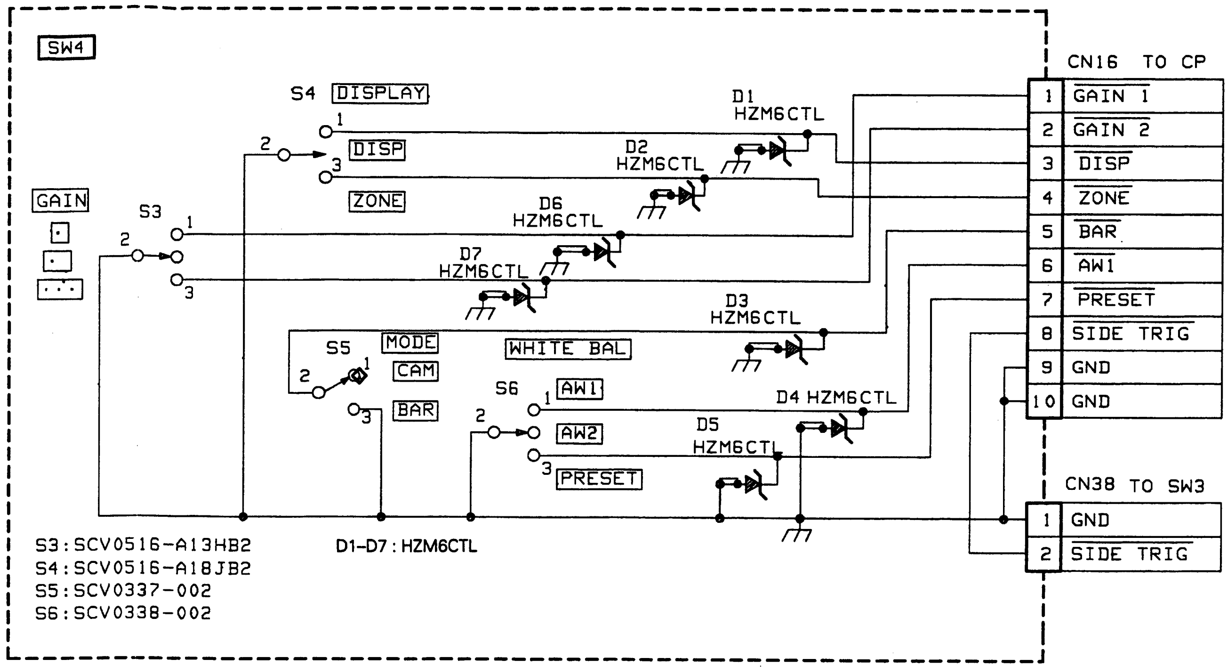
1C
Y axis
X axis

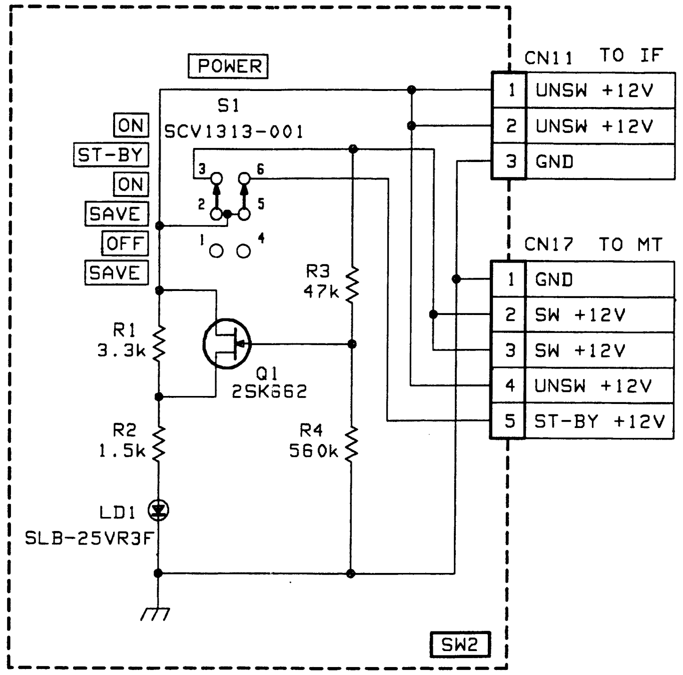
IC1	2B
IC2	1D
D1	1B
D2	2B
D3	2B
D4	1C
D5	1B
D6	1D
D7	1B
D8	1C
D9	1B
D10	1D
D11	1D
D12	1A
D13	1A
D14	1D
D15	1C
D16	2B
D17	1D
D18	1D
D19	1B
D20	1C
D21	1A
D22	1D
D23	1D
D24	2A
D25	2B
D26	1D
D27	1B
D28	1B
D29	1A
D30	1D
D31	2B
D32	2A
D41	2D
D42	2D
D43	2D
D44	2D
D45	2D
D46	2D
D47	2D
D48	2C
D49	2D
D50	2D
D51	2C
D52	2D
D53	2D
D54	2C
D55	2C
D56	2C
D57	2C
D58	2C
D59	2C
D60	2C
D61	2C

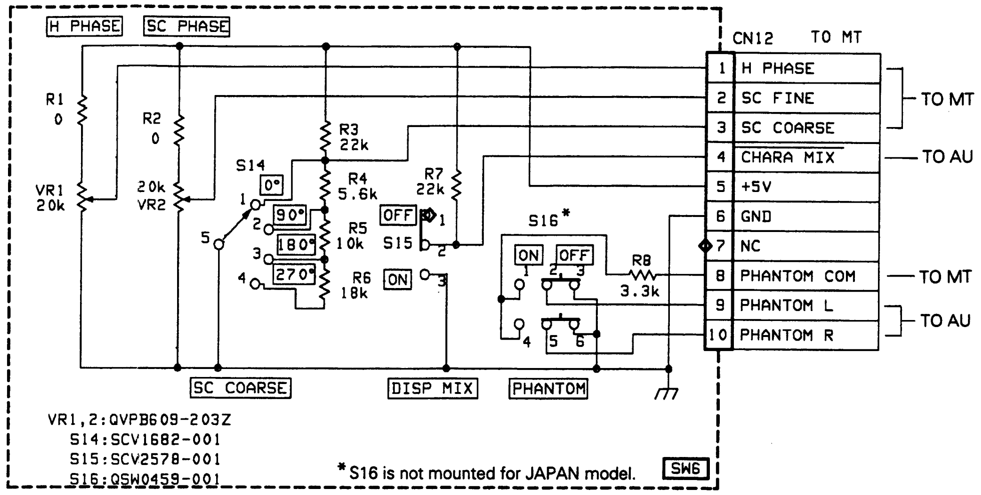
R1	1A
R2	1A
R3	1A
R4	1A
R5	2B
R6	2B
R7	2B
R8	2B
R9	1A
R10	1B
R11	1D
R12	2D
R13	1D
C1	1D
CN11	2A
CN34	1C
CN35	1A
CN39	2A
CN40	2B
CN41	2D
CN43	2B
K1	2A
K2	2A
K3	2A
K4	1C
K5	1C
LC1	2A
LC2	2B

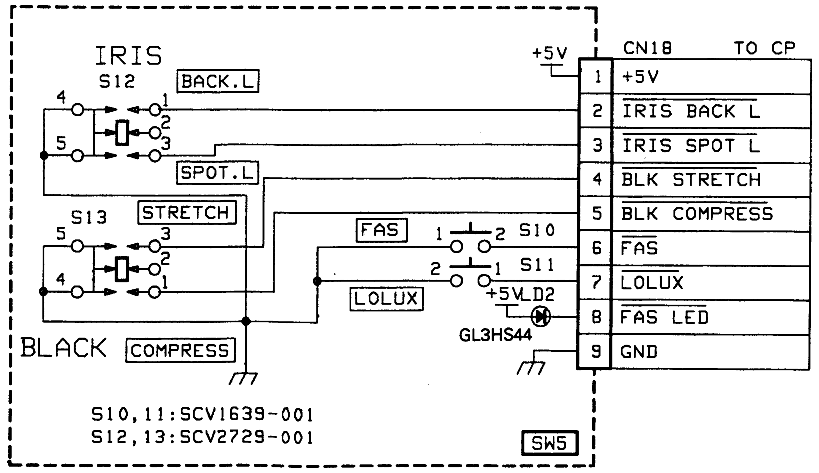
3.30 SW1/SW2/SW3/SW4/SW5/SW6/CN BOARD SCHEMATIC DIAGRAMS 14/15/16/17/18/19/20

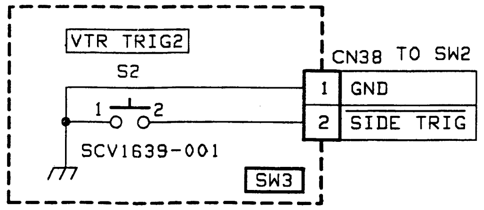

ACCU FOCUS
CN15 TO AU
1 ACCU FOCUS
2 AWB
3 FRONT TRIG
4 ZEBRA
5 GND
S7
ACCU FOCUS/WHITE
S8
VTR TRIG1
WHT
ON
ZEBRA S9
OFF
S7:SCV0516-A18JB2
S8:SCV1639-001
S9:SCV0337-002
SW1

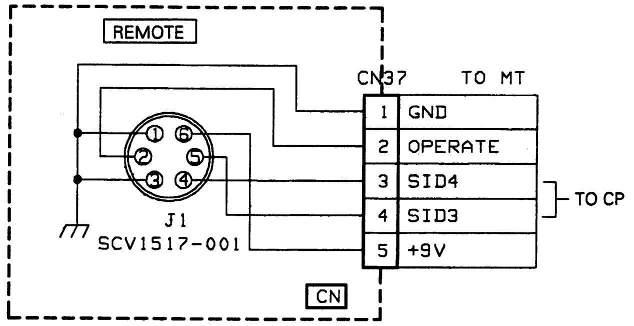

SW4
CN16 TO CP
1 GAIN 1
2 GAIN 2
3 DISP
4 ZONE
5 BAR
6 AW1
7 PRESET
8 SIDE TRIG
9 GND
10 GND
S4 DISPLAY
DISP
ZONE
GAIN
S3
D1 HZM6CTL
D2 HZM6CTL
D6 HZM6CTL
D7 HZM6CTL
D3 HZM6CTL
D4 HZM6CTL
D5 HZM6CTL
S5 MODE
CAM
BAR
WHITE BAL
S6 AW1
AW2
PRESET
CN38 TO SW3
1 GND
2 SIDE TRIG
S3:SCV0516-A13HB2
S4:SCV0516-A18JB2
S5:SCV0337-002
S6:SCV0338-002
D1-D7 : HZM6CTL


POWER
S1
SCV1313-001
ON
ST-BY
ON
SAVE
OFF
SAVE
CN11 TO IF
1 UNSW +12V
2 UNSW +12V
3 GND
CN17 TO MT
1 GND
2 SW +12V
3 SW +12V
4 UNSW +12V
5 ST-BY +12V
R3 47k
R1 3.3k
Q1 2SK662
R2 1.5k
R4 560k
LD1 SLB-25VR3F
SW2


H PHASE
SC PHASE
CN12 TO MT
1 H PHASE
2 SC FINE
3 SC COARSE
4 CHARA MIX
5 +5V
6 GND
7 NC
8 PHANTOM COM
9 PHANTOM L
10 PHANTOM R
TO MT
TO AU
TO MT
TO AU
R1 0
R2 0
VR1 20k
20k VR2
R3 22k
R4 5.6k
R5 10k
R6 18k
R7 22k
S14
0°
90°
180°
270°
OFF
ON
S15
S16*
ON
OFF
R8 3.3k
SC COARSE
DISP MIX
PHANTOM
VR1,2:QVPB609-203Z
S14:SCV1682-001
S15:SCV2578-001
S16:QSW0459-001
*S16 is not mounted for JAPAN model.
SW6


IRIS
S12
BACK.L
SPOT.L
S13
STRETCH
BLACK
COMPRESS
FAS
S10
S11
LOLUX
+5V
D2
GL3HS44
CN18 TO CP
1 +5V
2 IRIS BACK L
3 IRIS SPOT L
4 BLK STRETCH
5 BLK COMPRESS
6 FAS
7 LOLUX
8 FAS LED
9 GND
S10,11:SCV1639-001
S12,13:SCV2729-001
SW5

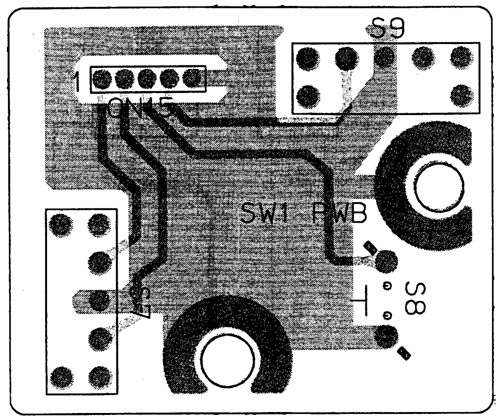

VTR TRIG2
S2
SCV1639-001
CN38 TO SW2
1 GND
2 SIDE TRIG
SW3


REMOTE
CN37 TO MT
1 GND
2 OPERATE
3 SID4
4 SID3
5 +9V
TO CP
J1
SCV1517-001
CN

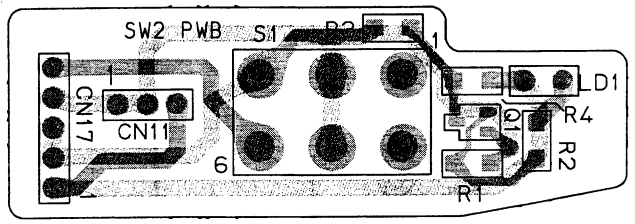
93425

3.31 SW1/SW2/SW3/SW4/SW5/SW6/CN CIRCUIT BOARDS

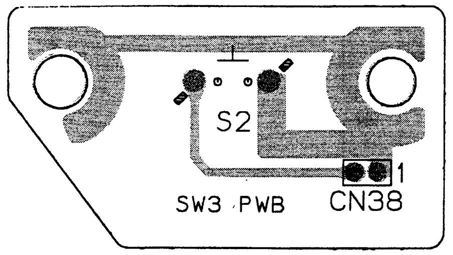
- **SW1 board**


S9
1
CN15
SW1 PWB
S7
S8

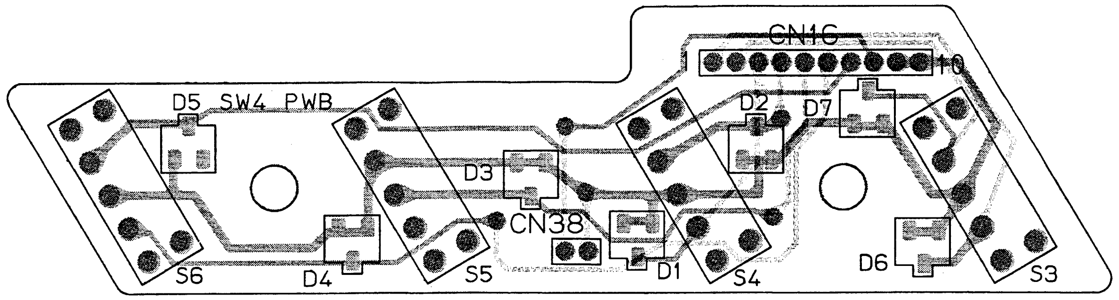
- **SW2 board**


SW2 PWB
S1
R3
1
LD1
R4
R2
R1
1
CN17
CN11
6

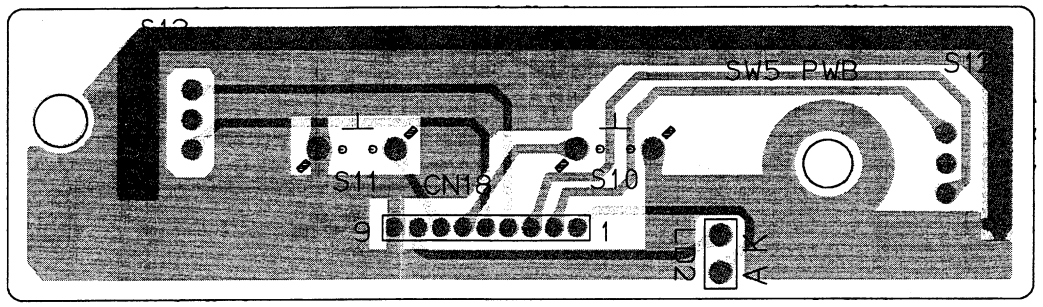
- **SW3 board**


S2
1
SW3 PWB
CN38

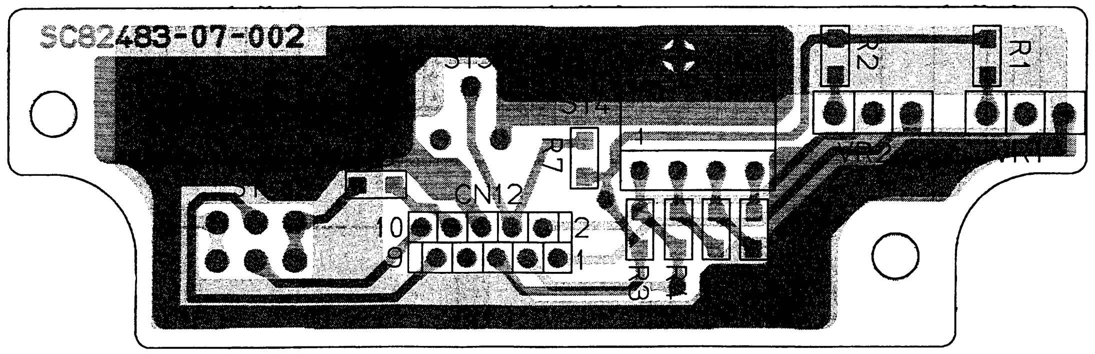
- **SW4 board**


CN16
1
10
D5
SW4 PWB
D2
D7
D3
CN38
D6
S6
D4
S5
D1
S4
S3

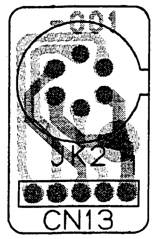
- **SW5 board**


SW5 PWB
S11
S11
CN18
S10
9
1
LD2

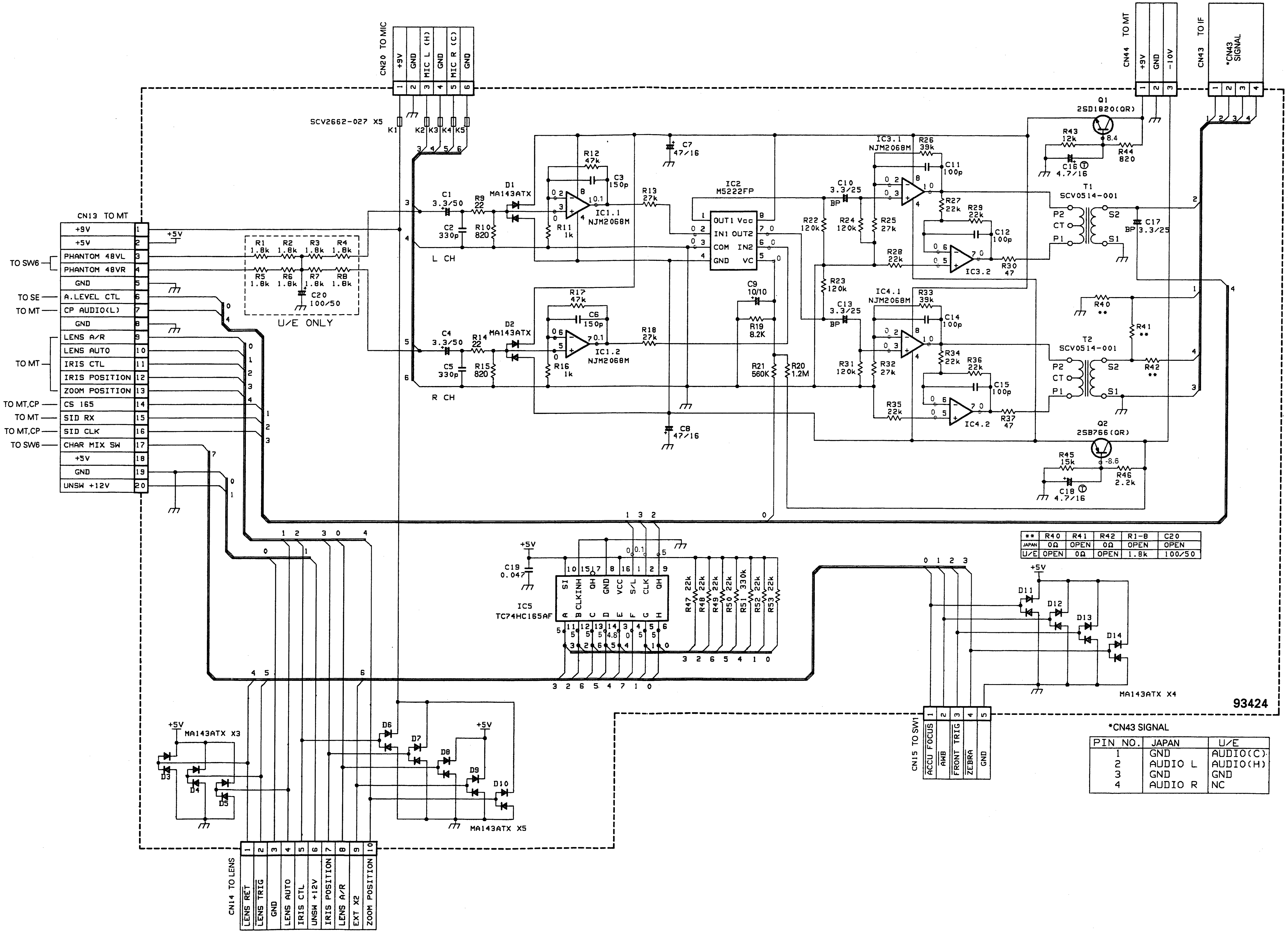
- **SW6 board**


SC82483-07-002
S13
S14
R2
R1
1
CN12
10
2
9
1
R3
VR1

- **CN board**



3.32 AU BOARD SCHEMATIC DIAGRAM 2|1



CN20 TO MIC
1 +9V
2 GND
3 MIC L (H)
4 GND
5 MIC R (C)
6 GND
SCV2662-027 X5
K1 K2 K3 K4 K5
CN13 TO MT
1 +9V
2 +5V
3 PHANTOM 48VL
4 PHANTOM 48VR
5 GND
6 A.LEVEL CTL
7 CP AUDIO(L)
8 GND
9 LENS A/R
10 LENS AUTO
11 IRIS CTL
12 IRIS POSITION
13 ZOOM POSITION
14 CS 165
15 SID RX
16 SID CLK
17 CHAR MIX SW
18 +5V
19 GND
20 UNSW +12V
TO SW6
TO SE
TO MT
TO MT
TO MT,CP
TO MT
TO MT,CP
TO SW6
+5V
R1 1.8k
R2 1.8k
R3 1.8k
R4 1.8k
R5 1.8k
R6 1.8k
R7 1.8k
R8 1.8k
C20 100/50
U/E ONLY
C1 3.3/50
C2 330p
R9 22
R10 820
D1 MA143ATX
L CH
C4 3.3/50
C5 330p
R14 22
R15 820
D2 MA143ATX
R CH
R12 47k
C3 150p
R11 1k
IC1.1 NJM2068M
R17 47k
C6 150p
R16 1k
IC1.2 NJM2068M
R13 27k
R18 27k
C7 47/16
C8 47/16
IC2 M5222FP
OUT1 Vcc
IN1 OUT2
COM IN2
GND VC
C9 10/10
R19 8.2K
R21 560K
R20 1.2M
C10 3.3/25 BP
C13 3.3/25 BP
R22 120k
R23 120k
R24 120k
R25 27k
R31 120k
R32 27k
IC3.1 NJM2068M
R26 39k
C11 100p
R27 22k
R29 22k
C12 100p
R28 22k
IC3.2
R30 47
IC4.1 NJM2068M
R33 39k
C14 100p
R34 22k
R36 22k
C15 100p
R35 22k
IC4.2
R37 47
Q1 2SD1820(QR)
R43 12k
R44 820
C16 Ⓣ 4.7/16
8.4
T1 SCV0514-001
P2 CT P1 S2 S1
C17 BP 3.3/25
R40 **
R41 **
R42 **
T2 SCV0514-001
Q2 2SB766(QR)
R45 15k
R46 2.2k
C18 Ⓣ 4.7/16
-8.6
CN44 TO MT
1 +9V
2 GND
3 -10V
CN43 TO IF
*CN43 SIGNAL
+5V
C19 0.047
IC5 TC74HC165AF
SI CLKINH QH GND VCC S/L CLK QH
A B C D E F G H
R47 22k
R48 22k
R49 22k
R50 22k
R51 330k
R52 22k
R53 22k
+5V
MA143ATX X3
D3 D4 D5
D6 D7 D8 D9 D10
+5V
MA143ATX X5
CN14 TO LENS
1 LENS RET
2 LENS TRIG
3 GND
4 LENS AUTO
5 IRIS CTL
6 UNSW +12V
7 IRIS POSITION
8 LENS A/R
9 EXT X2
10 ZOOM POSITION
D11 D12 D13 D14
MA143ATX X4
CN15 TO SW1
1 ACCU FOCUS
2 AWB
3 FRONT TRIG
4 ZEBRA
5 GND
93424

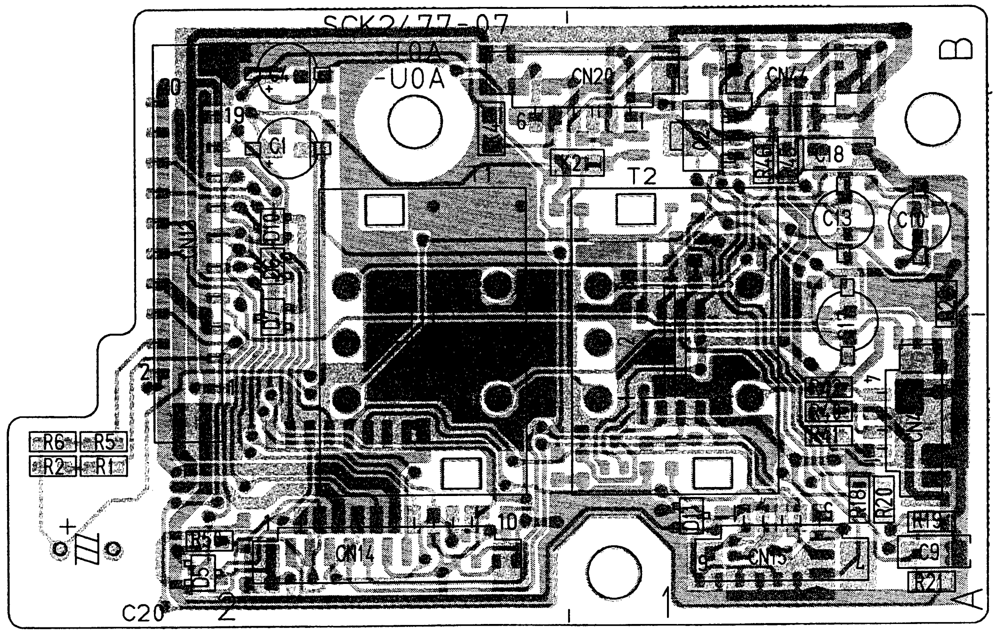
**	R40	R41	R42	R1-8	C20
JAPAN	0Ω	OPEN	0Ω	OPEN	OPEN
U/E	OPEN	0Ω	OPEN	1.8k	100/50

*CN43 SIGNAL

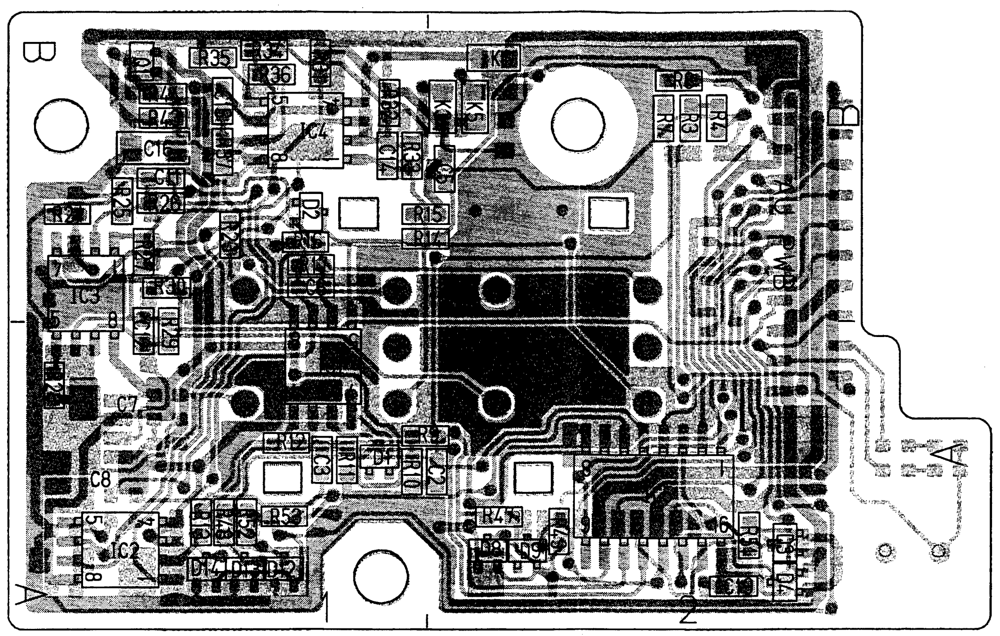
PIN NO.	JAPAN	U/E
1	GND	AUDIO(C)
2	AUDIO L	AUDIO(H)
3	GND	GND
4	AUDIO R	NC

3.33 AU CIRCUIT BOARD

– Side A –

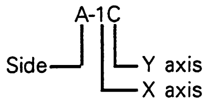

SCK2477-07
-U0A
CN20
CN44
T2
C18
C3
C10
C1
Q1
R6
R5
R2
R1
C20
CN14
CN13
CN15
R19
C9
R21
R18
R20
1
2
A
B

– Side B –


B
A
R35
R36
IC4
IC3
IC2
C15
C16
C7
C8
D2
R15
R17
1
2

●ADDRESS TABLE OF BOARD PARTS

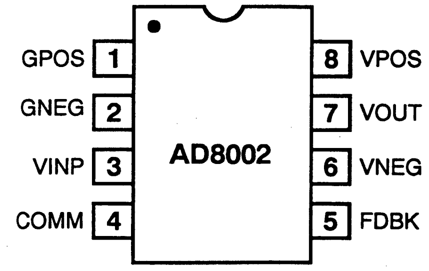
Each address may have an address error by one interval.


A-1C
Side
Y axis
X axis

IC1	B- 1A
IC2	B- 1A
IC3	B- 1B
IC4	B- 1B
IC5	B- 2A
Q1	B- 1B
Q2	A- 1B
D1	B- 1A
D2	B- 1B
D3	B- 2A
D4	B- 2A
D5	A- 2A
D6	A- 2B
D7	A- 2A
D8	B- 1A
D9	B- 2A
D10	A- 2B
D11	A- 1A
D12	B- 1A
D13	B- 1A
D14	B- 1A
R1	A- 2A
R2	A- 2A
R3	B- 2B
R4	B- 2B
R5	A- 2A
R6	A- 2A
R7	B- 2B
R8	B- 2B
R9	B- 1A
R10	B- 1A
R11	B- 1A
R12	B- 1A
R13	B- 1A
R14	B- 1B
R15	B- 1B
R16	B- 1B
R17	B- 1B
R18	A- 1A
R19	A- 1A
R20	A- 1A
R21	A- 1A
R22	A- 1B
R23	B- 1B
R24	B- 1B
R25	B- 1B
R26	B- 1B
R27	B- 1B
R28	B- 1A
R29	B- 1A
R30	B- 1B
R31	B- 1B
R32	B- 1B
R33	B- 1B
R34	B- 1B
R35	B- 1B
R36	B- 1B
R37	B- 1B
R40	A- 1A
R41	A- 1A
R42	A- 1A
R43	B- 1B
R44	B- 1B
R45	A- 1B
R46	A- 1B
R47	B- 2A
R48	B- 1A
R49	B- 2A
R50	A- 2A
R51	B- 2A
R52	B- 1A
R53	B- 1A
C1	A- 2B
C2	B- 1A
C3	B- 1A
C4	A- 2B
C5	B- 1B
C6	B- 1B
C7	B- 1A
C8	B- 1A
C9	A- 1A
C10	A- 1B
C11	B- 1B
C12	B- 1A
C13	A- 1B
C14	B- 1B
C15	B- 1B
C16	B- 1B
C17	A- 1A
C18	A- 1B
C19	B- 2A
C20	A- 2A
CN13	A- 2B
CN14	A- 2A
CN15	A- 1A
CN20	A- 1B
CN43	A- 1A
CN44	A- 1B
K1	B- 2B
K2	A- 1B
K3	B- 1B
K4	A- 2B
K5	B- 1B
T1	A- 2A
T2	A- 1A

3.34 BLOCK DIAGRAM OF IC's

■ AD603AR-X 【ANALOG DEVICES】
(Variable Gain CTL Amplifier)

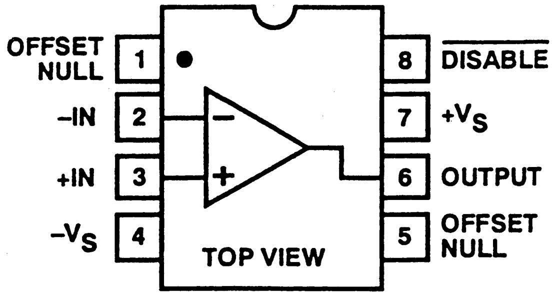


GPOS 1
GNEG 2
VINP 3
COMM 4
AD8002
8 VPOS
7 VOUT
6 VNEG
5 FDBK

■ Pin funoction

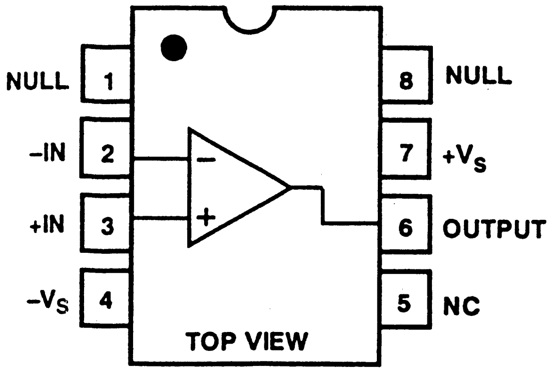
Pin No.	Pin Name
1	GPOS Gain CTL Input " HI "
2	GNEG Gain CTL Input " LOW "
3	VINP Amp. Input
4	COMM GND
5	FDBK Feedback
6	VNEG Vss
7	VOUT Output
8	VPOS V_{DD}

■ AD810AR-X 【ANALOG DEVICES】
(Hi-Speed Low Power Op.Amp)



OFFSET NULL 1
-IN 2
+IN 3
-VS 4
8 DISABLE
7 +VS
6 OUTPUT
5 OFFSET NULL
TOP VIEW

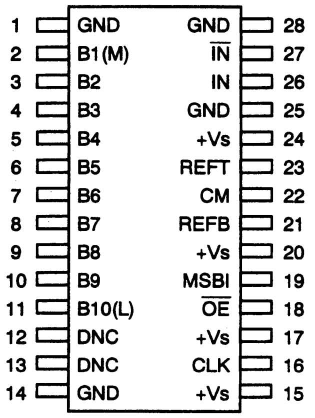
■ AD817AR-X 【ANALOG DEVICES】
(Hi-Speed Low Power Op.Amp)



NULL 1
-IN 2
+IN 3
-VS 4
8 NULL
7 +VS
6 OUTPUT
5 NC
TOP VIEW

NC = NO CONNECT

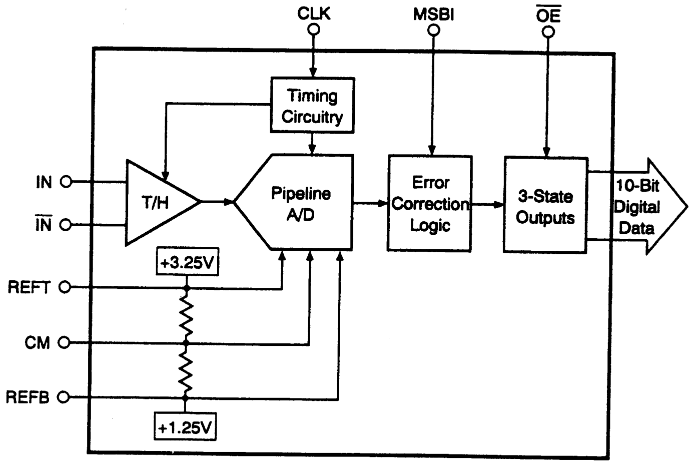
■ ADS820U-X 【BBJ】
(A/D Converter)



1 GND GND 28
2 B1(M) IN 27
3 B2 IN 26
4 B3 GND 25
5 B4 +Vs 24
6 B5 REFT 23
7 B6 CM 22
8 B7 REFB 21
9 B8 +Vs 20
10 B9 MSBI 19
11 B10(L) OE 18
12 DNC +Vs 17
13 DNC CLK 16
14 GND +Vs 15

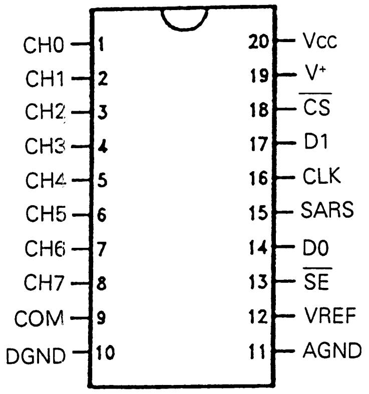
(Top View)

Block Diagram



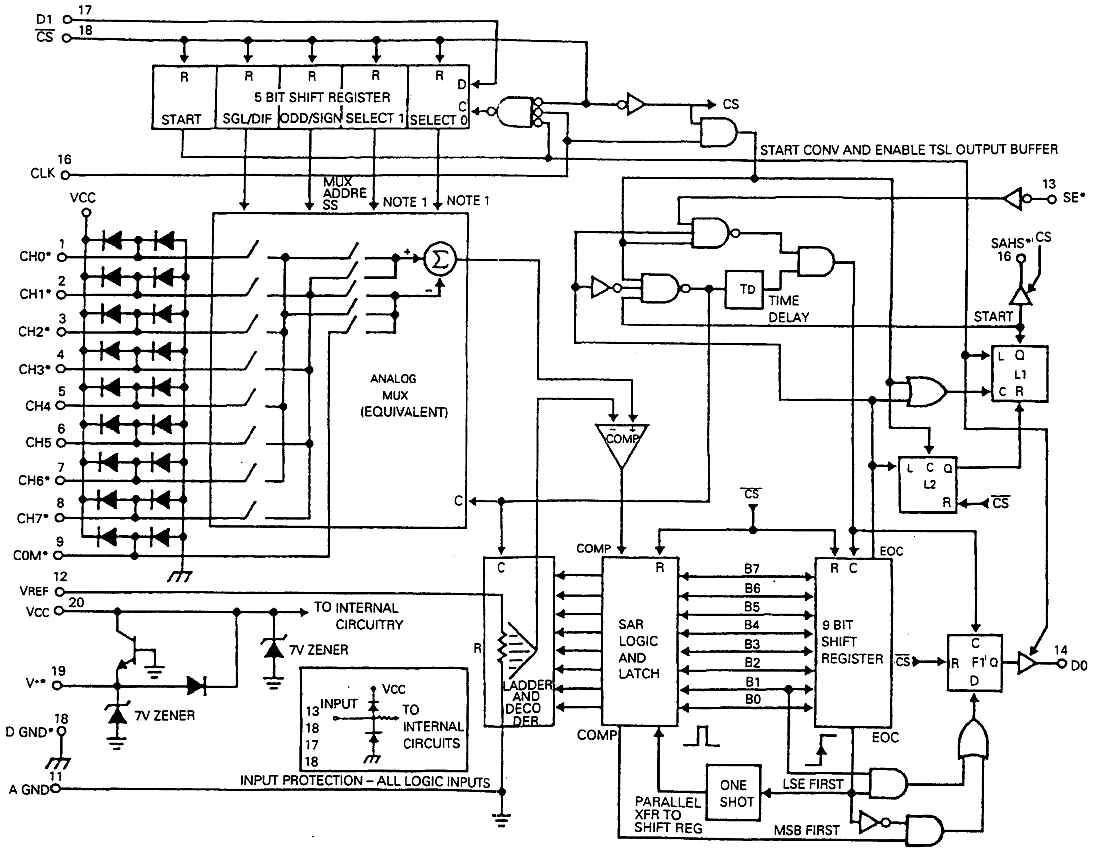
CLK
MSBI
OE
Timing Circuitry
IN
IN
T/H
Pipeline A/D
Error Correction Logic
3-State Outputs
10-Bit Digital Data
REFT
+3.25V
CM
REFB
+1.25V

■ ADC0838CCWM-X
【NATIONAL SEMI CONDUCTOR】
(8 Bit Serial I/O A/D Converters with Multiplexer Options)



CH0 1
CH1 2
CH2 3
CH3 4
CH4 5
CH5 6
CH6 7
CH7 8
COM 9
DGND 10
20 Vcc
19 V+
18 CS
17 D1
16 CLK
15 SARS
14 D0
13 SE
12 VREF
11 AGND

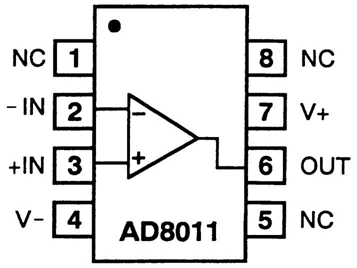
(TOP VIEW)



D1 17
CS 18
5 BIT SHIFT REGISTER
START
SGL/DIF
ODD/SIGN
SELECT 1
SELECT 0
CS
START CONV AND ENABLE TSL OUTPUT BUFFER
CLK 16
VCC
MUX ADDRESS
NOTE 1
13 SE*
SAHS* CS 16
CH0* 1
CH1* 2
CH2* 3
CH3* 4
CH4 5
CH5 6
CH6* 7
CH7* 8
COM* 9
ANALOG MUX (EQUIVALENT)
TD TIME DELAY
START
L1
L2
COMP
12 VREF
VCC 20
TO INTERNAL CIRCUITRY
7V ZENER
V+* 19
D GND* 18
A GND 11
7V ZENER
INPUT VCC TO INTERNAL CIRCUITS
INPUT PROTECTION – ALL LOGIC INPUTS
LADDER AND DECODER
SAR LOGIC AND LATCH
B7 B6 B5 B4 B3 B2 B1 B0
9 BIT SHIFT REGISTER
EOC
14 D0
ONE SHOT
PARALLEL XFR TO SHIFT REG
LSE FIRST
MSB FIRST

* Some of these functions/pins are not available with other options

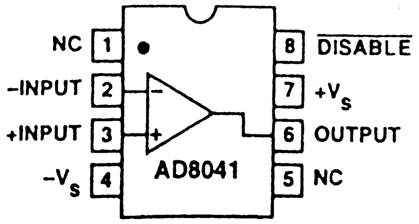
■ AD8011AR-X 【ANALOG DEVICES】
(Current Feedback Amplifier)



NC 1
-IN 2
+IN 3
V- 4
8 NC
7 V+
6 OUT
5 NC
AD8011

■ AD8041AR-XE 【ANALOG DEVICES】
(Op.Amplifier)

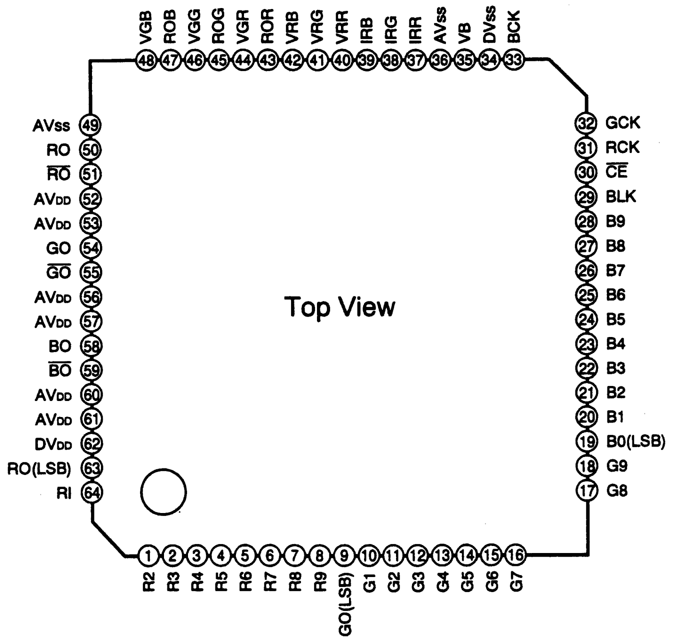
(Top View)



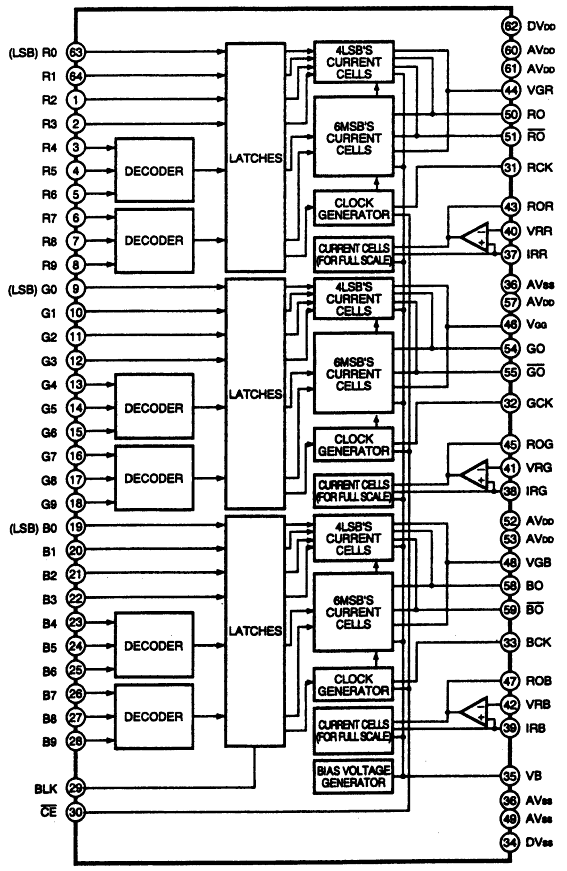
NC 1
-INPUT 2
+INPUT 3
-VS 4
8 DISABLE
7 +VS
6 OUTPUT
5 NC
AD8041

NC=Not connected

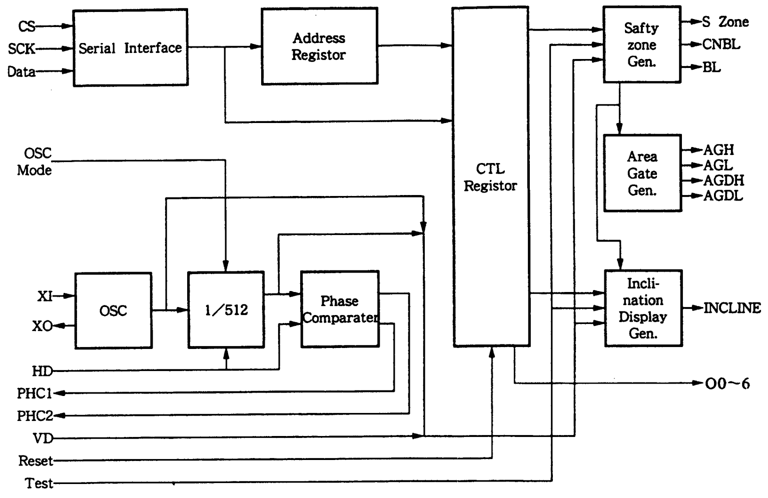
■ CXD2307R-X 【SONY】
(10 Bit 50MSPS RGB 3 Channel D/A Converter)


VGB
ROB
VGG
ROG
VGR
ROR
VRB
VRG
VRR
IRB
IRG
IRR
AVss
VB
DVss
BCK
AVss 49
RO 50
$\overline{\text{RO}}$ 51
AVDD 52
AVDD 53
GO 54
$\overline{\text{GO}}$ 55
AVDD 56
AVDD 57
BO 58
$\overline{\text{BO}}$ 59
AVDD 60
AVDD 61
DVDD 62
RO(LSB) 63
RI 64
32 GCK
31 RCK
30 $\overline{\text{CE}}$
29 BLK
28 B9
27 B8
26 B7
25 B6
24 B5
23 B4
22 B3
21 B2
20 B1
19 B0(LSB)
18 G9
17 G8
Top View
R2
R3
R4
R5
R6
R7
R8
R9
GO(LSB)
G1
G2
G3
G4
G5
G6
G7

Block Diagram


(LSB) R0 63
R1 64
R2 1
R3 2
R4 3
R5 4
R6 5
R7 6
R8 7
R9 8
(LSB) G0 9
G1 10
G2 11
G3 12
G4 13
G5 14
G6 15
G7 16
G8 17
G9 18
(LSB) B0 19
B1 20
B2 21
B3 22
B4 23
B5 24
B6 25
B7 26
B8 27
B9 28
BLK 29
$\overline{\text{CE}}$ 30
DECODER
LATCHES
4LSB'S CURRENT CELLS
6MSB'S CURRENT CELLS
CLOCK GENERATOR
CURRENT CELLS (FOR FULL SCALE)
BIAS VOLTAGE GENERATOR
62 DVDD
60 AVDD
61 AVDD
44 VGR
50 RO
51 $\overline{\text{RO}}$
31 RCK
43 ROR
40 VRR
37 IRR
36 AVss
57 AVDD
46 VGG
54 GO
55 $\overline{\text{GO}}$
32 GCK
45 ROG
41 VRG
38 IRG
52 AVDD
53 AVDD
48 VGB
58 BO
59 $\overline{\text{BO}}$
33 BCK
47 ROB
42 VRB
39 IRB
35 VB
36 AVss
49 AVss
34 DVss

■ JCS0005 【JVC】
(Area Gate Generator)


CS
SCK
Data
Serial Interface
Address Registor
CTL Registor
Safty zone Gen.
S Zone
CNBL
BL
Area Gate Gen.
AGH
AGL
AGDH
AGDL
Incli-nation Display Gen.
INCLINE
O0~6
OSC Mode
XI
XO
OSC
1/512
Phase Comparater
HD
PHC1
PHC2
VD
Reset
Test

● Pin function of JCS0005

All input terminals are internally pulled up.

Pin No.	Symbol	I/O	Function
1	$\overline{\text{CS}}$	I	Chip select terminal of serial input/output.
3	SCK	I	Write-in clock for serial input/output. Data is read at rise of SCK.
5	DATA	I	Serial data input. To start with LSB.
6	VSS	—	GND (power)
7	OSC MODE	I	H : To use internal oscillator. L : To use external clock.
8	PHC1	O	Phase comparison output of internal PLL. Output level is low when clock is ahead of HD in the phase while it is high when clock is behind HD in the phase. In other period clock has high impedance.
9	$\overline{\text{PHC2}}$	O	Phase comparison output of internal PLL. Output level is high when clock is ahead of HD in the phase while it is low when clock is behind HD in the phase. In other period clock has high impedance.
11	XI	O	Oscillator input. When external clock is used, it is input to this terminal. External clock must be synchronous with HD. A feedback resistor is built in between XI and XO.
12	XO	O	Oscillator output.
14	$\overline{\text{06}}$	O	General output 6
16	$\overline{\text{VD}}$	I	Vertical sync. signal input (negative)
17	$\overline{\text{HD}}$	I	Horizontal sync. signal input (negative)
18	VSS	—	GND (power)
19	VDD	—	+5 V power supply
20	$\overline{\text{RESET}}$	I	Reset input. Low level input (for more than 1 µsec at least) at power on inhibits output of AGDL, AGDH, SZONE, INCLINE and turns levels of general outputs $\overline{\text{O0}}$ to $\overline{\text{O6}}$ to low.
21	$\overline{\text{TEST}}$	I	To be used for IC inspection. For use, turn to open or connect with VDD.
22	SZONE	O	Safety zone indication output
23	INCLINE	O	Inclination angle indication output
24	$\overline{\text{CNBL}}$	O	Blanking output for cinema mode
25	AGDL	O	To output area gate in combination 2 bits of AGDL and AGDH. Output can be turned on/off by setting of internal register.
27	AGDH	O	AGDL | AGDH Area gate 0 period (blanking period) | O | O Area gate 1 period | O | I Area gate 2 period | I | O Area gate 3 period | I | I
30	$\overline{\text{O0}}$	O	General output 0
31	VSS	—	GND
33	$\overline{\text{O1}}$	O	General output 1
35	$\overline{\text{O2}}$	O	General output 2
37	$\overline{\text{O3}}$	O	General output 3
39	$\overline{\text{O4}}$	O	General output 4
42	VSS	—	GND (power)
43	VDD	—	+5 V power supply
44	$\overline{\text{O5}}$	O	General output 5
45	AG4	O	H output in area gate 4 period, L output in other period. Blanking is applied by internal BL signal.
46	AGL	O	To output area gate in combination of 2 bits of AGL and AGH.
47	AGH	O	AGDL | AGDH Area gate 0 period (blanking period) | O | O Area gate 1 period | O | I Area gate 2 period | I | O Area gate 3 period | I | I
48	BL	O	H output in blanking period, L output in other period.

■ HM63021FP-S 【HITACHI】
(2,048 word x 8 bit C-MOS S-RAM)

Delay line	1H/2H	TBC	Variable Speed Conversion	Time Compress and Expand	Mode		Time Compress and Expand	Variable Speed Conversion	TBC	1H/2H	Delay line
Mode 1					1	28	Vcc				
$\overline{\mathrm{CLK}}$		$\overline{\mathrm{RCLK}}$			2	27	Mode 2				
$\overline{\mathrm{RES}}$		$\overline{\mathrm{RRES}}$			3	26	Mode 3		$\overline{\mathrm{RDEC}}$	$\overline{\mathrm{DEC\ 2}}$	
D in 0					4	25	$\overline{\mathrm{OE}}$				
D in 1					5	24	D out 0				
D in 2					6	23	D out 1				
D in 3					7	22	D out 2				
D in 4					8	21	D out 3				
D in 5					9	20	D out 4				
D in 6					10	19	D out 5				
D in 7					11	18	D out 6				
$\overline{\mathrm{WE}}$					12	17	D out 7				
$\overline{\mathrm{DEC\ 1}}$		$\overline{\mathrm{WDEC}}$	High Z		13	16	$\overline{\mathrm{WRES}}$			DS	$\overline{\mathrm{DEC\ 3}}$
Vss					14	15	$\overline{\mathrm{WCLK}}$			$\overline{\mathrm{WT}}$	$\overline{\mathrm{DEC\ 4}}$

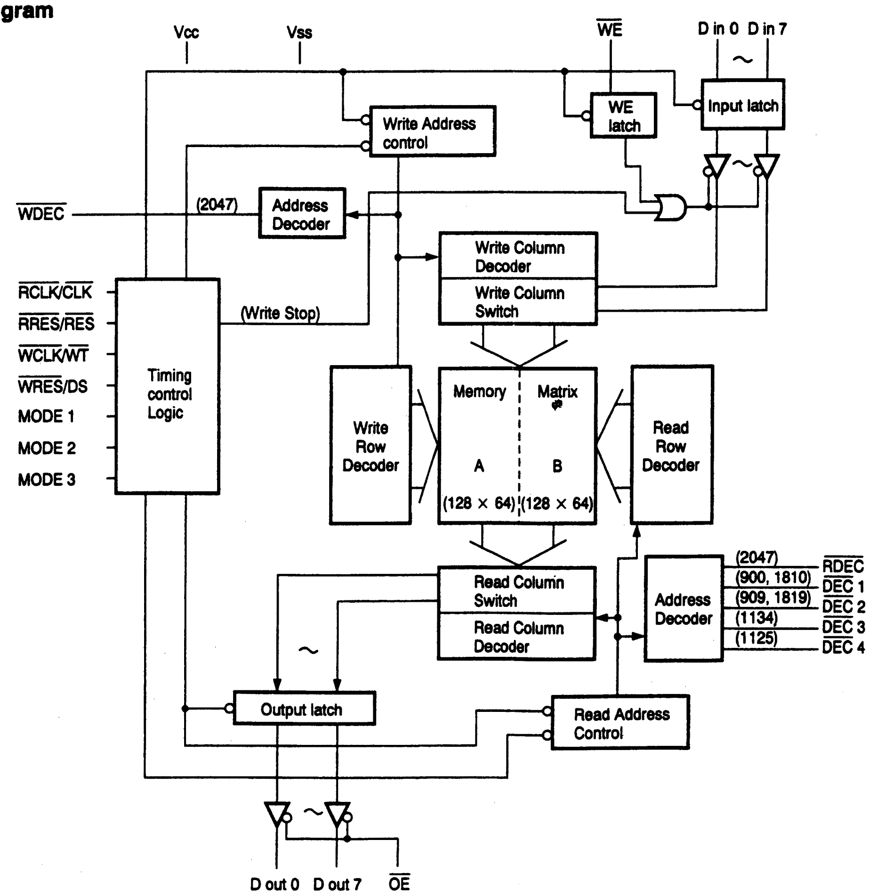
Read Control
INPUT
OUTPUT
Write Control

Mode Pin Settings

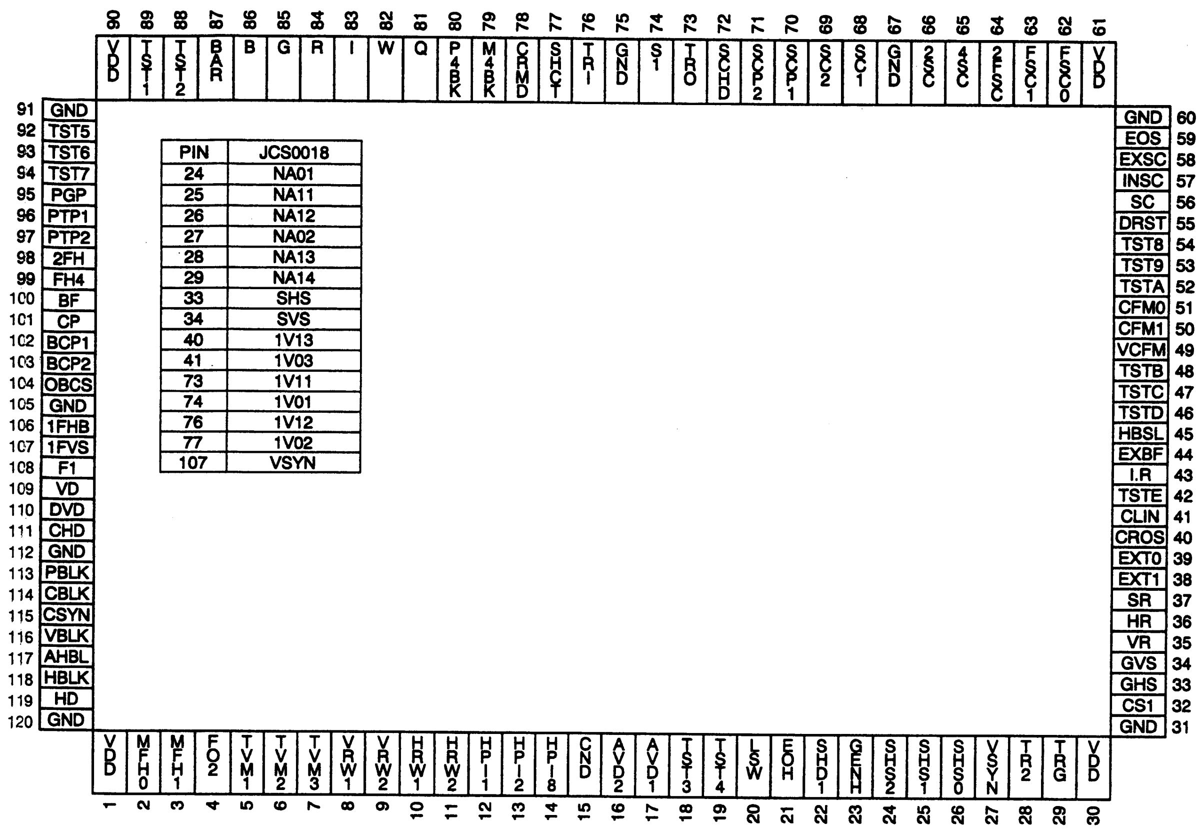
Mode Signal			Function
Mode 1	Mode 2	Mode 3	
H	H	H	Time Compress and Expand Mode
H	H	L	Variable Speed Conversion Mode
H	L	—*	TBC mode
L	H	—*	1H/2H Delay mode
L	L	—*	Delay Line mode

NOTE: * DEC Output Signal ($\overline{\mathrm{RDEC}}$, $\overline{\mathrm{DEC\ 2}}$)

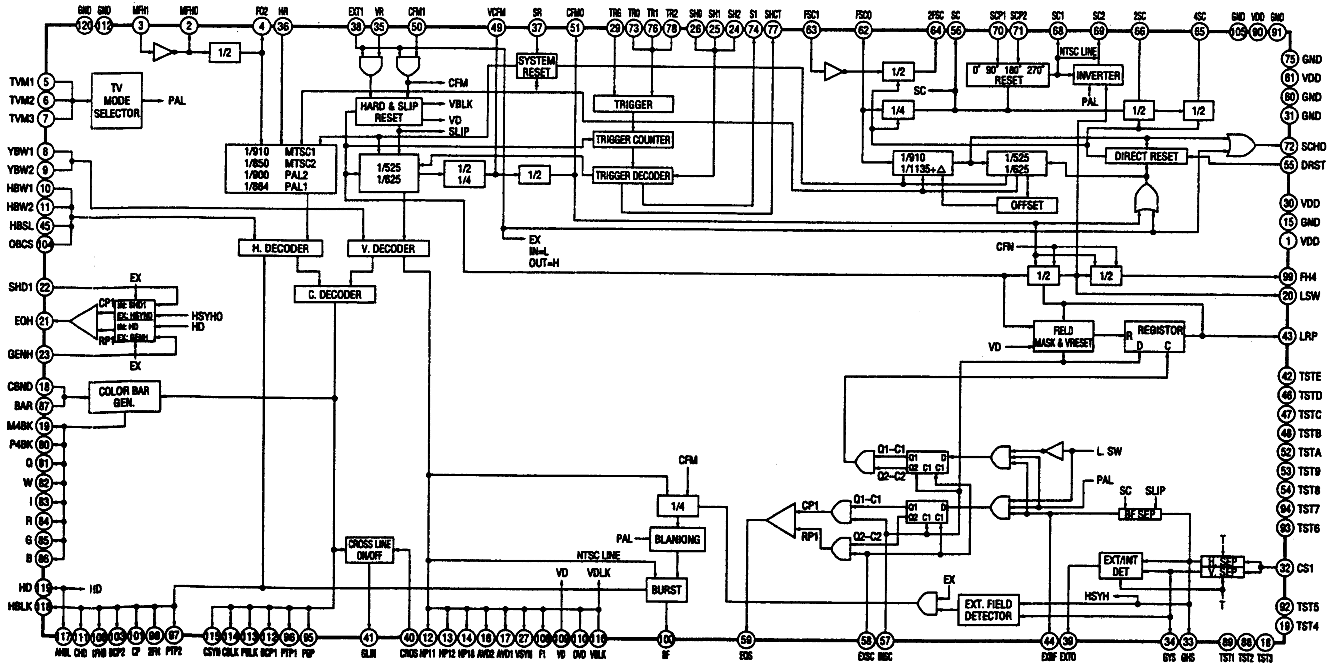
Block Diagram


Vcc
Vss
WE
D in 0 D in 7
~
WE latch
Input latch
Write Address control
WDEC
(2047)
Address Decoder
Write Column Decoder
Write Column Switch
RCLK/CLK
RRES/RES
WCLK/WT
WRES/DS
MODE 1
MODE 2
MODE 3
(Write Stop)
Timing control Logic
Write Row Decoder
Memory Matrix
A
B
(128 × 64) (128 × 64)
Read Row Decoder
Read Column Switch
Read Column Decoder
Address Decoder
(2047)
(900, 1810)
(909, 1819)
(1134)
(1125)
RDEC
DEC 1
DEC 2
DEC 3
DEC 4
Output latch
Read Address Control
D out 0 D out 7
OE

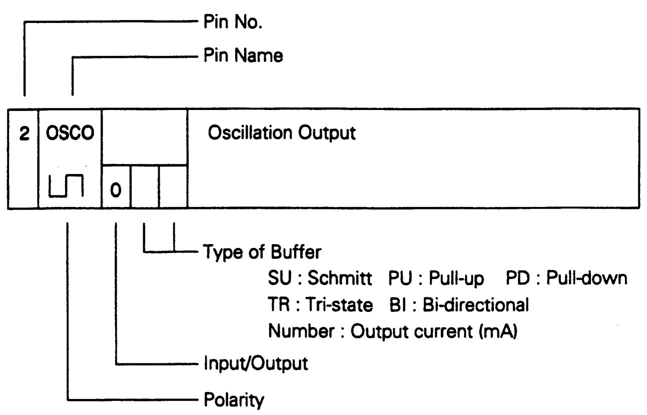
■ JCS0027 【JVC】
(SSG)


90 VDD
89 TST1
88 TST2
87 BAR
86 B
85 G
84 R
83 I
82 W
81 Q
80 P4BK
79 M4BK
78 CRMD
77 SHCT
76 TRI
75 GND
74 S1
73 TRO
72 SCHD
71 SCP2
70 SCP1
69 SC2
68 SC1
67 GND
66 2SC
65 4SC
64 2FSC
63 FSC1
62 FSC0
61 VDD
91 GND
92 TST5
93 TST6
94 TST7
95 PGP
96 PTP1
97 PTP2
98 2FH
99 FH4
100 BF
101 CP
102 BCP1
103 BCP2
104 OBCS
105 GND
106 1FHB
107 1FVS
108 F1
109 VD
110 DVD
111 CHD
112 GND
113 PBLK
114 CBLK
115 CSYN
116 VBLK
117 AHBL
118 HBLK
119 HD
120 GND
60 GND
59 EOS
58 EXSC
57 INSC
56 SC
55 DRST
54 TST8
53 TST9
52 TSTA
51 CFM0
50 CFM1
49 VCFM
48 TSTB
47 TSTC
46 TSTD
45 HBSL
44 EXBF
43 I.R
42 TSTE
41 CLIN
40 CROS
39 EXT0
38 EXT1
37 SR
36 HR
35 VR
34 GVS
33 GHS
32 CS1
31 GND
1 VDD
2 MFH0
3 MFH1
4 FO2
5 TVM1
6 TVM2
7 TVM3
8 VRW1
9 VRW2
10 HRW1
11 HRW2
12 HPI1
13 HPI2
14 HPI8
15 CND
16 AVD2
17 AVD1
18 TST3
19 TST4
20 LSW
21 EOH
22 SHD1
23 GENH
24 SHS2
25 SHS1
26 SHS0
27 VSYN
28 TR2
29 TRG
30 VDD

PIN	JCS0018
24	NA01
25	NA11
26	NA12
27	NA02
28	NA13
29	NA14
33	SHS
34	SVS
40	1V13
41	1V03
73	1V11
74	1V01
76	1V12
77	1V02
107	VSYN


GND GND MFH1 MFH0 FO2 HR EXT1 VR CFM1 VCFM SR CFM0 TRG TR0 TR1 TR2 SH0 SH1 SH2 S1 SHCT FSC1 FSC0 2FSC SC SCP1 SCP2 SC1 SC2 2SC 4SC GND VDD GND
1/2
TVM1
TVM2
TVM3
TV MODE SELECTOR
PAL
SYSTEM RESET
CFM
HARD & SLIP RESET
VBLK
VD
SLIP
TRIGGER
TRIGGER COUNTER
TRIGGER DECODER
YBW1
YBW2
HBW1
HBW2
HBSL
OBCS
1/910 MTSC1
1/850 MTSC2
1/900 PAL2
1/884 PAL1
1/525
1/625
1/2
1/4
H. DECODER
V. DECODER
C. DECODER
EX
IN=L
OUT=H
SHD1
EOH
GENH
CP1
RP1
HSYHO
HD
COLOR BAR GEN.
CBND
BAR
M4BK
P4BK
Q
W
I
R
G
B
HD
HBLK
CROSS LINE ON/OFF
PAL
BLANKING
NTSC LINE
VD
VDLK
BURST
0° 90° 180° 270° RESET
NTSC LINE
INVERTER
SC
1/4
1/910
1/1135+△
1/525
1/625
OFFSET
DIRECT RESET
CFN
FIELD MASK & VRESET
REGISTOR
R D C
Q1–C1
Q2–C2
L. SW
PAL
SC SLIP
BF SEP
EXT/INT DET
H. SEP
V. SEP
EX
EXT. FIELD DETECTOR
HSYH
GND
VDD
GND
GND
SCHD
DRST
VDD
GND
VDD
FH4
LSW
LRP
TSTE
TSTD
TSTC
TSTB
TSTA
TST9
TST8
TST7
TST6
CS1
TST5
TST4
AHBL CHD 1FHB BCP2 CP 2FH PTP2
CSYN CBLK PBLK BCP1 PTP1 PGP
CLIN
CROS HPI1 HPI2 HPI8 AVD2 AVD1 VSYN F1 VD DVD VBLK
BF
EOS
EXSC INSC
EXBF EXT0
GVS GHS
TST1 TST2 TST3

Terminal Specifications of JCS0023 (4th Revision)


Pin No.
Pin Name
2
OSCO
⊔⊓
0
Oscillation Output
Type of Buffer
SU : Schmitt PU : Pull-up PD : Pull-down
TR : Tri-state BI : Bi-directional
Number : Output current (mA)
Input/Output
Polarity

Pin No.	Pin Name	Function
1	VDD	+5 Power supply
2	MFHO ⊔⊓	Synchronizing oscillation output O Output terminal for built-in oscillator
3	MFHI ⊓⊔	Synchronizing oscillation input I Input terminal for built-in oscillator
4	F02 ⊓⊔	1/2 divided output O 9 1/2 divided output of synchronizing oscillator
5	TVM1 —	TV mode 1 I PU
6	TVM2 —	TV mode 2 I PU
7	TVM3 —	TV mode 3 I PU

	NTSC1 1820FH	NTSC2 1716FH	PAL2 1816FH	PAL1 1728FH	PALM 1716FH	SECAM 1716FH
TVM1	L	H	L	H	L	H
TVM2	L	L	H	H	L	L
TVM3	L	L	L	L	H	H

Pin No.	Pin Name	Function
8	VBW1 —	V. blanking control 1 I PU
9	VBW2 —	V. blanking control 2 I PU

VBW1	L	H	L	H
VBW2	L	L	H	H
NTSC1	21H	20H	19H	18H
NTSC 2	21H	20H	19H	18H
PAL1	26H	25H	24H	23H
PAL2	26H	25H	24H	23H
PALM	21H	20H	19H	18H
SECAM	26H	25H	24H	23H

Pin No.	Pin Name	Function
10	HBW1 —	H. blanking control 1 I PU
11	HBW2 —	H. blanking control 2 I PU

HBW1	L	H	L	H
HBW2	L	L	H	H
NTSC1	157T	156T	154T	152T
NTSC2	143T	147T	146T	152T
PAL1	162T	159T	156T	153T
PAL2	170T	167T	164T	161T
PALM	148T	147T	146T	144T
SECAM	162T	159T	156T	153T

Pin No.	Pin Name	Function
12	HP11 ⊔	H. pulse 11 H. pulse to be active at 11H, 13H, 15H and 17H. O 9
13	HP12 ⊔	H. pulse 12 H. pulse to be active at 12H and 14H. O 9
14	HP18 ⊔	H. pulse 18 H. pulse to be active at 18H. O 9
15	GND	Ground
16	AVD2 ⊔	Pre-vertical drive pulse 2 Vertical drive pulse whose phase is 8H ahead of VD pulse. Functions as subcarrier blanking for SECAM system. O 9
17	AVD1 ⊔	Pre-vertical drive pulse 1 Vertical drive pulse whose phase is 1H ahead of VD pulse. O 9
18	TST3 —	Test terminal 3 Set this terminal open in general. I PU
19	TST4 —	Test terminal 4 Set this terminal open in general. I PU
20	LSW ⊓⊔	Line switch Half-divided FH output. Switches color difference signal of neighboring lines by 180° in phase for PAL system. O 9
21	EOH —	H. synchronizing digital phase comparison output As compared with leading edge of SHDI; when internal HD has advanced phase: Low level, when internal HD has lagged phase: High level, when internal HD is in-phase: High impedance. O TR 13
22	SHDI ‾┐_	H. synchronizing digital phase comparison input (trailing detection) Input of horizontal drive signal originating from subcarrier. Active when EXTI is low level. When this is inactive, GHS (No. 33) is internally connected. I SH PU
23	GENH ‾┐_	H. synchronizing digital phase comparison input (trailing detection) Input for external synchronization, horizontal synchronization and phase adjustment. Active when EXTI is high level. When this is inactive, HD (No. 119) is internally connected. I SH PU

Pin No.	Pin Name	Function
24	SHS2 —	Shutter speed setting 2 Random shutter setting function (Refer to the specifications.) I PU
25	SHS1 —	Shutter speed setting 1 Random shutter setting function (Refer to the specifications.) I PU
26	SHS0 —	Shutter speed setting 0 Random shutter setting function (Refer to the specifications.) I PU

SHS2	SHS1	SHS0	Shutter speed NTSC	PAL
L	L	L	1/60	1/50
L	L	H	1/100	1/120
L	H	L	1/250	
L	H	H	1/500	
H	L	L	1/1000	
H	L	H	1/2000	
H	H	L	1/4000	
H	H	H	1/10000	

Pin No.	Pin Name	Function
27	VSYN ⊔	V. sync. output Vertical synchronizing signal of V. EQ pulse width. O 9
28	TR2 —	Sync. reset mode setting For sync. reset mode setting when random shutter setting functions is activated. I PU
29	TRG —	Trigger input Trigger input to activate random shutter setting function. (Refer to the random shutter specifications.) I PU
30	VDD	+5V power supply
31	GND	Ground
32	CSI ⊔	Ext. composite sync. signal input To input external composite synchronizing signal for horizontal and vertical separation and ext. sync. signal input detection. I SH PU
33	GHS ⊔	Horizontal separate sync. Horizontal separate signal of external composite synchronizing signal. 1/2 equivalent pulse is not included. O 9
34	GVS ⊔	Vertical separate sync. Vertical separate signal of external composite synchronizing signal. 1/2 equivalent pulse is not included. O 9

Pin No.	Pin Name	Function
35	VR ⊔	Vertical reset External synchronizing input by slip system. If this system is input in vertical sync. period, hard reset is activated. Input in other period stops internal counter for a period of pulse width. I PU
36	HR ‾┐_	Horizontal reset Presets horizontal component 1T before rise of HD. Jitters in a period shorter than 140 ns are absorbed. However, operation is not secured for continuous input. I PU
37	SR ‾┐_	System reset Inside of IC is forcibly initialized regardless of internal or external synchronization. VR and HR inputs are ineffective. Jitters in a period shorter than 140 ns are absorbed. I PU
38	EXTI —	Internal/External synchronization setting input L : Internal synchronization H : External synchronization I PD
39	EXTO —	Internal/External synchronization setting output L: Without CSI input After detection of no SHS, another SHS is not detected for a period of 8 fields. H: With CSI input After detection of SHS, 200 or more SHS's are detected in 1 vertical period. O 9
40	CROS —	Cross ON/OFF input L: To stop cross output H: To activate cross output operation For detail, refer to supplementary specifications of respective terminals. I PD
41	CLIN ⊓	Cross output To output a cross in the center of screen. For detail, refer to supplementary specifications of respective terminals. O 9
42	TSTE —	Test terminal E Set this terminal open in general. I PU
43	LR ⊔	Line reset When EXTI is external synchronization (High level), setting signal is supplied to LSW. When internal burst is ahead of external burst in phase, High level is output. When internal burst is behind external burst in phase, Low level is output (for 6 clocks of SC). Phase comparison is not operated for one field after output. For detail, refer to supplementary specifications of respective terminals. O 9

Pin No.	Pin Name	Function
44	EXBF	Brust flag separate output With detection of one or more H. sync pulse from CSI input, pulse whose width is for 6 cycles of subcarrier is output. For details, refer to supplementary specifications of respective terminals. O 9
45	HBSL	H. blanking reset To switch output position of IFHB (106). L: System delay 900 ns approx. H: System delay 450 ns approx. I PU
46	TSTD	Test terminal D Set this terminal open in general. BI PU 9
47	TSTC	Test terminal C Set this terminal open in general. BI PU 9
48	TSTB	Test terminal B Set this terminal open in general. I PU
49	VCFM	VTR color frame Color frame for VTR exclusively. 2-field period for NTSC1, NTSC2 and PAL. 4-field period for PAL1, PAL2 and SECAM. O 9
50	CFMI	Color frame input Effective with EXTI being low level. Used for color frame control in external synchronization. Reset to synchronizing circuit by the slip system. I SH PU
51	CFMO	Color frame output Pulse output at the beginning of every color frame. 4-field period for NTSC1 and NTSC2. 8-field period for PAL1, PAL2, PALM and SECAM. O 9
52	TSTA	Test terminal A Set this terminal open in general. I PU
53	TST9	Test terminal 9 Set this terminal open in general. I PU

Pin No.	Pin Name	Function
54	TST8	Test terminal 8 Set this terminal open in general. I PU
55	DRST	Direct reset terminal When EXTI is low level, the following operations are realized. To switch reset operation of horizontal counter for subcarrier. To reset color frame synchronizing with horizontal counter with High level; To reset color frame with Low level. I PU
56	SC	Subcarrier output To monitor subcarrier signal connected internally with digital phase comparator. When phase of SC1 (68) is 0°, this output is inphase. O 9
57	INSC	Internal subcarrier input Shall be connected with SC (56). Effective when EXBF is low level. Pulse rise is detected. I
58	EXSC	External subcarrier input Effective when EXBF is low level. Pulse rise is detected. I
59	EOS	Digital phase comparison output for subcarrier As compared with leading edge of EXSC; when internal SC has advanced phase : Low level, when internal SC has lagged phase : High level, when internal SC is in phase : High impedance. O TR 13
60	GND	Ground
61	VDD	+5V power supply
62	FSCO	Oscillator output for subcarrier O
63	FSCI	Oscillator input for subcarrier I
64	2FSC	Double subcarrier output Half-divided oscillator output for subcarrier O 13

Pin No.	Pin Name	Function
65	4SC	1/4 subcarrier output 1/4-divided output of subcarrier frequency O 9
66	2SC	1/2 subcarrier output 1/2-divided output of subcarrier frequency O 9
67	GND	Ground
68	SC1	Subcarrier 1 Subcarrier frequency output. Phase is changed by SCP1 and SCP2. In PAL mode, phase is not changed every H. O 9
69	SC2	Subcarrier 2 Subcarrier frequency output whose phase is 90° ahead of SC1. Phase is changed by SCP1 and SCP2. In PAL mode, phase is inverted by 180° every H. O 9
70	SCP1	Subcarrier select 1 Note: SC2 is expressed based on SC1. I PD
71	SCP1	Subcarrier select 2 I PD
72	SCHD	Subcarrier horizontal driver Horizontal drive pulse originating from subcarrier frequency. O 13
73	TR0	Random shutter control system setting input To set random shutter control system. L: 8-stage default control, H: Pulse width continuous control (Refer to the specifications of random shutter setting function.) I PD
74	SI	Stroboscope index output In normal operation, this output is for stroboscopic lamp emitting time. In random shutter operation, this output is for video output time. (Refer to the specifications of random shutter setting function.) O 9

SCP2	SCP1	SC1	SC2
L	L	0°	90° ahead (270°)
L	H	90°	90° ahead (0°)
H	L	180°	90° ahead (90°)
H	H	270°	90° ahead (180°)

Pin No.	Pin Name	Function
75	GND	Ground
76	TR1	Random reset system setting input To determine reset system setting system. L: SYNC reset system, H: SYNC non-reset system. (Refer to the specifications of random shutter setting function.) I PD
77	SHCT	Shutter control output Electronic shutter control signal. Shall be connected to SHCT (19) of TG (µPD9438GK). (Refer to the specifications of random shutter setting function.) O 9
78	CBMD	SMPTE/FULL To switch color bar signal to SMPTE or FULL. L: Full Field mode H: SMPTE mode Effective only with BAR signal of low level. I PU
79	M4BK	Color bar signal O 9
80	P4BK	Color bar signal O 9
81	Q	Color bar signal O 9
82	W	Color bar signal O 9
83	I	Color bar signal O 9

	BAR	CBMD	I	W
NTSC1 NTSC2	H L L	X H L	L Effective L	L Effective (75%W) L
PAL1 PAL2	H L L	X H L	L Effective L	L Effective (75%W) Effective (100W)
PALM	H L L	X H L	L Effective L	L Effective (75%W) Effective (100W)
SECAM	H L L	X H L	L Effective L	L Effective (75%W) L

	Q	P4BK	M4BK
NTSC1 NTSC2	L Effective L	L Effective L	L Effective L
PAL1 PAL2	L Effective L	L Effective L	L Effective L
PALM	L Effective L	L Effective L	L Effective L
SECAM	L Effective L	L Effective L	L Effective L

Pin No.	Pin Name	Function
84	–R	Color bar signal O 9
85	G	Color bar signal O 9
86	B	Color bar signal O 9

	BAR	C3MD	B	G	R
NTSC1 NTSC2	H L	X X	L Effective	L Effective	L Effective
PAL1 PAL2	H L	X X	L Effective	L Effective	L Effective
PALM	H L	X X	L Effective	L Effective	L Effective
SECAM	H L	X X	L Effective	L Effective	L Effective

Pin No.	Pin Name	Function
87	BAR —	Color bar control (ON/OFF) I PU

BAR	R, G, B, I, Q, W, P4BK, M4BK
L	Effective
H	Fixed at Low level

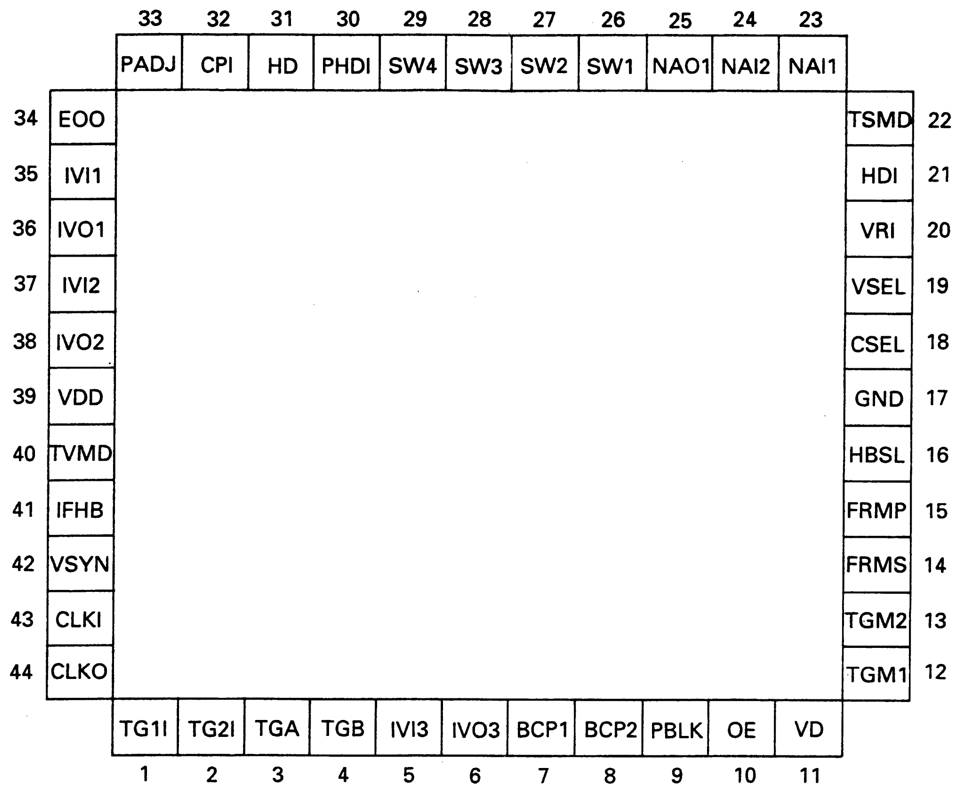
Pin No.	Pin Name	Function
88	TST2 —	Test terminal 2 Set this terminal open in general. I PU
89	TST1 —	Test terminal 1 Set this terminal open in general. I PU
90	VDD	+5V power supply
91	GND	Ground
92	TST5 —	Test terminal 5 Set this terminal open in general. I PU
93	TST6 —	Test terminal 6 Set this terminal open in general. I PU
94	TST7 —	Test terminal 7 Set this terminal open in general. O 9
95	PGP — —	Pilot gate pulse Uniform voltage level of two signals, one passes the 1FH delay line and the other does not pass the 1H line, with each other in order to compensate attenuation caused by the delay line. O 9
96	PTP1	Pilot pulse 1 Uniform voltage level of two signals, one passes the 1H delay line and the other does not pass the 1H line, with each other in order to compensate attenuation caused by the delay line. O 9
97	PTP2	Pilot pulse 2 Used to control video level. O 9
98	2FH	Double FH O 9

NTSC1	NTSC2	PAL1	PAL2	PALM	SECAM
31.468	31.468	31.25	31.25	31,468	31.25

Pin No.	Pin Name	Function
99	FH4	1/4FH Half-divided output of LSW. Equivalent to 25 Hz in PAL mode. O 9
100	BF	Burst flag Regulates period to insert subcarrier into back porch of horizontal sync. signal. Functions to switch chromaticity signal for every line in SECAM mode. O 9
101	CP	Clamp pulse Signal to clamp reference voltage of black level. O 9
102	BCP1	Black clamp pulse 1 Fixes black level of CCD output signal. O 9
103	BCP2	Black clamp pulse 2 Fixes black level of CCD output signal (at every H output). O 9
104	OBCS —	Optical black pulse select Switching of output position of horizontal BCP1 and BCP2. L: Frontward output H: Backward output I PU
105	GND	Ground
106	IFHB	Interface horizontal blanking Output pulse that is narrower than HBLK both in leading edge and trailing edge. O 9
107	IFVS	Interface vertical synchronization Normal function: To output vertical synchronization signal having the same pulse width of V. EQ pulse. Random shutter setting function: To output the same signal as V. sync. signal in the fall time. O 9
108	FI —	Field index Field discrimination signal. L: Field that HD and VD fall at the same time. H: Field that there is a time lag of 0.5H in falling between HD and VD. O 9
109	VD	Vertical drive pulse Pulse output at the beginning of every field. Used as the vertical timing standard for the set. O 9
110	DVD	Delayed vertical drive pulse Vertical drive signal that lags behind VD pulse. Controls camera's scanning timing and regulates activation time of sawtooth waveform of vertical deflection circuit. O 9
111	CHD	Delayed horizontal drive pulse Controls camera's scanning timing. Regulates activation time of sawtooth waveform of horizontal deflection circuit. O 9
112	GND	Ground
113	PBLK	Pre-blanking Composite blanking signal used for video processing. As compared with CBLK signal, this signal is narrower in the leading edge. O 9
114	CBLK	Composite blanking Horizontal and vertical composite blanking signal. O 9
115	CSYN	Composite sync. Composite synchronizing signal comprising of four signals of HSYN, VSYN, EQ and SAW. O 9
116	VBLK	V. blanking Vertical blanking signal whose pulse width can be changed with VBW1 and VBW2. O 9
117	AHBL	Pre-horizontal blanking Pulse that HBLK is advanced in breaking of leading edge. O 9
118	HBLK	H. blanking Horizontal blanking pulse whose pulse width can be changed with HBW1 and HBW2. O 9
119	HD	H. drive Pulse synchronized with beginning of respective lines. Used as horizontal timing standard of the set. O 13
120	GND	Ground

■ JCS0028 【JVC】
(H, V Timing Generator)

(Top View)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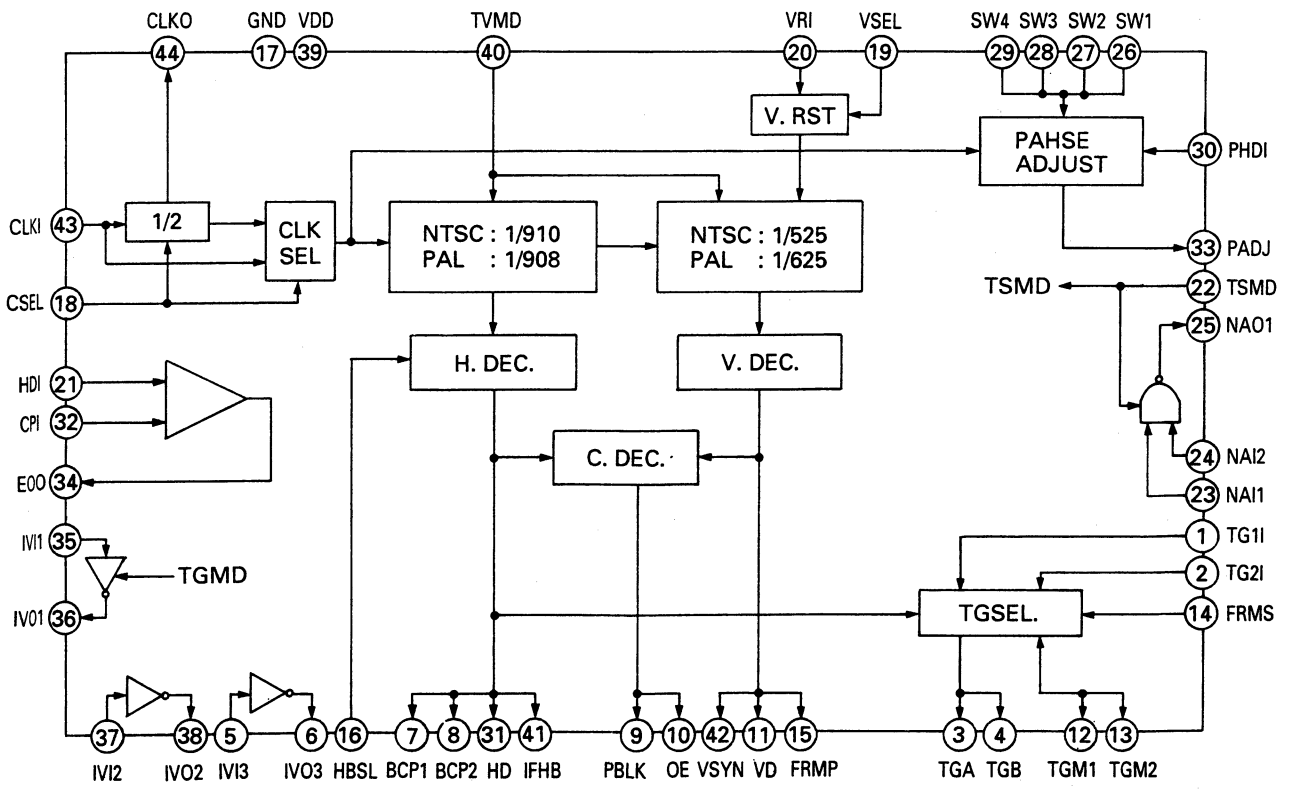
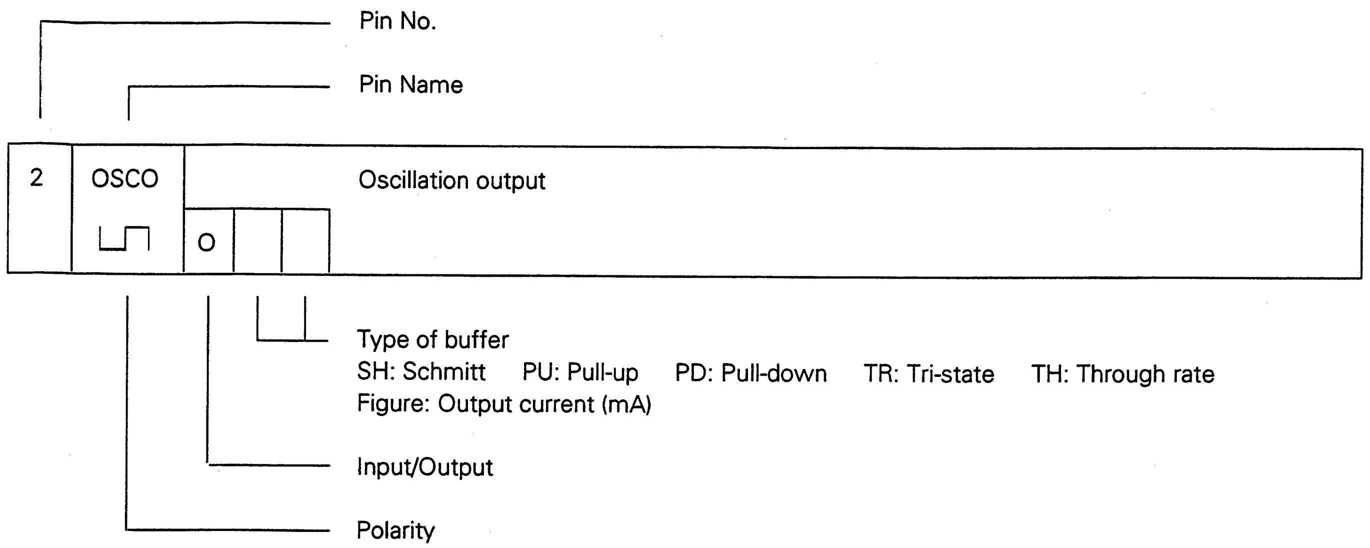
32 CPI
31 HD
30 PHDI
29 SW4
28 SW3
27 SW2
26 SW1
25 NAO1
24 NAI2
23 NAI1
34 EOO
35 IVI1
36 IVO1
37 IVI2
38 IVO2
39 VDD
40 TVMD
41 IFHB
42 VSYN
43 CLKI
44 CLKO
22 TSMD
21 HDI
20 VRI
19 VSEL
18 CSEL
17 GND
16 HBSL
15 FRMP
14 FRMS
13 TGM2
12 TGM1
1 TG1I
2 TG2I
3 TGA
4 TGB
5 IVI3
6 IVO3
7 BCP1
8 BCP2
9 PBLK
10 OE
11 VD

BLOCK DIAGRAM


CLKO
GND
VDD
TVMD
VRI
VSEL
SW4 SW3 SW2 SW1
V. RST
PAHSE ADJUST
PHDI
CLKI
1/2
CLK SEL
NTSC : 1/910
PAL : 1/908
NTSC : 1/525
PAL : 1/625
PADJ
TSMD
TSMD
NAO1
CSEL
H. DEC.
V. DEC.
HDI
CPI
C. DEC.
NAI2
NAI1
EOO
TG1I
IVI1
TGMD
TG2I
IVO1
TGSEL.
FRMS
IVI2
IVO2
IVI3
IVO3
HBSL
BCP1
BCP2
HD
IFHB
PBLK
OE
VSYN
VD
FRMP
TGA
TGB
TGM1
TGM2

PIN SPECIFICATIONS


Pin No.
Pin Name
2
OSCO
Oscillation output
O
Type of buffer
SH: Schmitt PU: Pull-up PD: Pull-down TR: Tri-state TH: Through rate
Figure: Output current (mA)
Input/Output
Polarity

No.	Symbol	Description
1	TG1 I	Transfer Gate 1 Input I Connect µPD9438AGK (11). If not used, do not change the level.
2	TG2 I	Transfer Gate 2 Input I Connect µPD9438AGK (12). If not used, do not change the level.
3	TGA	Transfer Gate A Output O 9 Electric charge transfer pulse output from TG1 I (1) for øV1A and øV3A use.
4	TGB	Transfer Gate B Output O 9 Electric charge transfer pulse output from TG2 I (2) for øV1B and øV3B use.
5	IVI3 —	Common Invert Input 3 I If not used, do not change level.
6	IVO3 —	Common Invert Output 3 O 9 The invert output of IVI3 (5).
7	BCP1	Black Clamp Pulse 1 O 9 Fixing the black level of CCD output signal. But, outputting per H.
8	BCP2	Black Clamp Pulse 2 O 9 Fixing the black level of CCD output signal. But, outputting per H.

No.	Symbol	Description
9	PBLK ¯|_|¯	Preblanking O | 9 | Used in process of picture treatment to blank the compound flying-back lines. This PBLK has a shape of narrow fore edge compared with CBLK.
10	OE —	ODD-EVEN O | 9 | The signal to distinguish the ODD and EVEN. L: ODD field, H: EVEN field
11	VD ¯|_|¯	Vertical Drive O | 9 | The vertical REF. timing, which is included in the pulse set, output ahead of each field.
12	TGM1 —	Read Out Mode 1 I | PD | When both of TGM1 (12) and TGM2 (13) are used, it is possible to set the READ OUT MODE.
13	TGM2 —	Read Out Mode 2 I | PD |
14	FRMS —	Frame Select I | PD | A/B frame switching terminal for 1 pixel read-out. L: A frame (TG3B, TG3A output only) H: B frame (TG1B, TG1A output only)
15	FRMP —	Frame Pulse O | 9 | One cycle of 4 fields output pulse. When connecting to FRMS (14), A/B frame is capable of being selected automatically.
16	HBSL —	Interface Horizontal Blanking Select I | PU | Position switching of IFHB (41). L: System delay 900 ns approx. H: System delay 450 ns approx.
17	GND	Grounding
18	CSEL —	Clock Select I | PD | It is used to select the frequency of input clock. L: 14.318 MHz (NTSC), 14.187 MHz (PAL), H: 28.636 MHz (NTSC), 28.37 MHz (PAL)
19	VSEL —	VD/V SYNC Select I | PD | It is used to select signals that are input to VRI (20). L: VSYNC signal input, H: VD signal input (PBLK ends before 3H.)
20	VRI ¯|_	EXT. Vertical SYNC Input I | SH | VSYNC/VD signals are selected according to VSEL (19). Depending on the input, the other IC and vertical SYNC may be taken off.
21	HDI (RPI) ¯|_	EXT. Horizontal SYNC Input (Ref. input for digital phase comparator) I | SH | Depending on the input of HD signal, the horizontal SYNC may be taken off. (To detect when the input signal goes off.)
22	TSMD —	Test Mode Switching I | PO | Normally set to open. L: Normal operation H: Common NAND (23-25) and common invert (35 and 36) become test terminals.

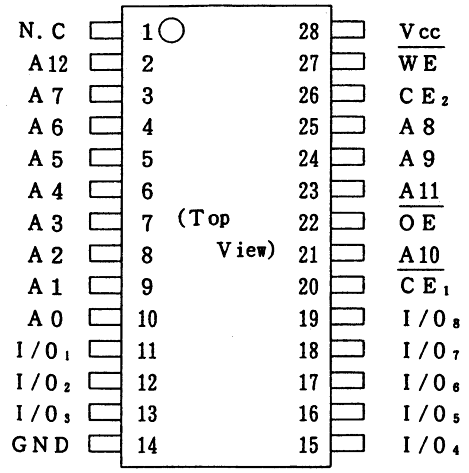
TGM2	TGM1	Read Out Mode Set
L	L	4 pixels read-out (field)
L	H	3 pixels read-out
H	L	2 pixels read-out (frame)
H	H	1 pixel read-out

No.	Symbol	Description
23	NAI1 —	Common NAND Input 1 I | | | If not used, fix the level.
24	NAI2 —	Common NAND Input 2 I | | | If not used, fix the level.
25	NAO1 —	Common NAND Output 1 BI | 9 | The NAND outputs of NAI1 (20) and NAI2 (21).
26	SW1 —	Delay Set 1 1 step = 70 ns approx. I | PD |
27	SW2 —	Delay Set 2 I | PD |
28	SW3 —	Delay Set 3 I | PD |
29	SW4 —	Delay Set 4 I | PD |
30	PHDI ¯|_	Phase Adj. Input I | | | To detect when the HD input for phase adj. circuit goes off. If not used, fix the level.
31	HD ¯|_|¯	Horizontal Drive O | 13 | The horizontal timing signal, which is included in the pulse set, synchronized with start of each line, and the REF. signal used for SYNC.
32	CPI ¯|_	Comparison Input for Digital Phase Comparator I | SH | To detect when the input signal goes off.
33	PADJ ¯|_|¯	Phase Adj. Output O | 9 | For outputting 2.3µS width delayed pulse the value of which is set by SW1~SW4 (26, 27, 28 and 29) after PHD1 (30) has gone off.
34	EOO —	Digital Phase Comparison Output O | TR | 9 CPI's relation with RPI: Same phase: High impedance Leading phase: Low level Delayed phase: High level

Step	SW4	SW3	SW2	SW1	Count value
1	L	L	L	L	0
2	L	L	L	H	1
3	L	L	H	L	2
4	L	L	H	H	3
5	L	H	L	L	4
6	L	H	L	H	5
7	L	H	H	L	6
8	L	H	H	H	7
9	H	L	L	L	8
10	H	L	L	H	9
11	H	L	H	L	10
12	H	L	H	H	11
13	H	H	L	L	12
14	H	H	L	H	13
15	H	H	H	L	14
16	H	H	H	H	15

No.	Symbol	Description			
35	IVI1	Common Invert Input 1			
	—	I			If not used, fix the level.
36	IVO1	Common Invert Output 1			
	—	BI	9		Invert output of IVI1 (35).
37	IVI2	Common Invert Input 2			
	—	I			If not used, fix the level.
38	IVO2	Common Invert Output 2			
	—	O	9		Invert output of IVI1 (37).
39	VDD	+5V Power Supply			
40	TVMD	TV Mode Switching			
	—	I	PD		Switching of NTSC and PAL L: NTSC mode, H: PAL mode
41	IFHB	Interface Horizontal Blanking			
	‾|_|‾	O	9		The pulse output with narrow leading and later edges compared with HCBLK. The position of output changes depending on HBSL (16).
42	VSYN	Vertical SYNC.			
	‾|_|‾	O	9		The vertical SYNC output in the period of vertical EQ pulse.
43	CLKI	Clock Input			
	_|‾|_|	I			28 MHz, 14 MHz clock input can be selected by CSEL (15).
44	CLKO	Clock Output			
	|_|‾|	O	9		When 28 MHz is input to CLKI (43), half-divided frequency is output. When 14 MHz is input to CLKI (43), 14 MHz is output.

■ LH5168N-10L 【SHARP】
(64K SRAM)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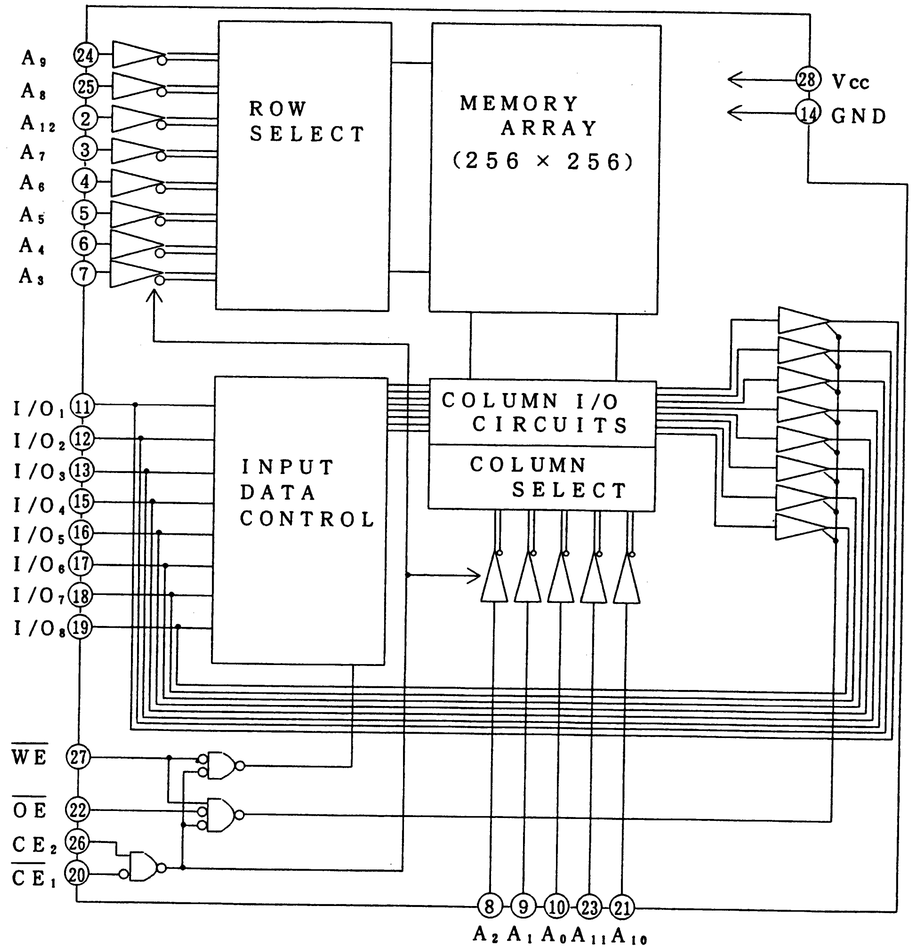
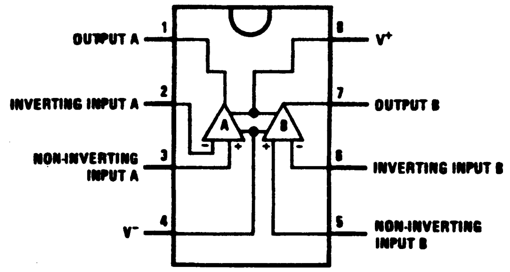
A7 3
A6 4
A5 5
A4 6
A3 7
A2 8
A1 9
A0 10
I/O1 11
I/O2 12
I/O3 13
GND 14
(Top View)
28 Vcc
27 WE
26 CE2
25 A8
24 A9
23 A11
22 OE
21 A10
20 CE1
19 I/O8
18 I/O7
17 I/O6
16 I/O5
15 I/O4


A9 24
A8 25
A12 2
A7 3
A6 4
A5 5
A4 6
A3 7
ROW SELECT
MEMORY ARRAY (256 × 256)
28 Vcc
14 GND
I/O1 11
I/O2 12
I/O3 13
I/O4 15
I/O5 16
I/O6 17
I/O7 18
I/O8 19
INPUT DATA CONTROL
COLUMN I/O CIRCUITS
COLUMN SELECT
WE 27
OE 22
CE2 26
CE1 20
8 9 10 23 21
A2 A1 A0 A11 A10

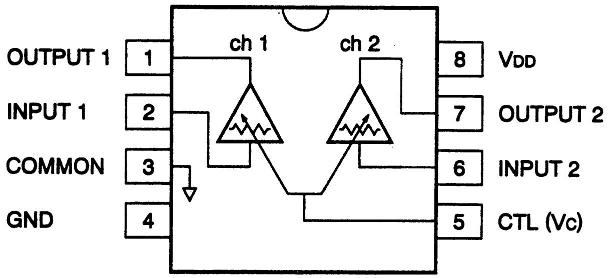
Name	Signal
$A_0 \sim A_{12}$	Address Input
$\overline{CE_1}$/CE_2	Chip Enable
$\overline{WE}$	Write Enable
$\overline{OE}$	OUTPUT
$I/O_1 \sim I/O_8$	Data I/O
N. C.	Non Connection

■ LMC6082IM-X 【National Semiconductor】
(Precision CMOS Dual Op.Amp)


OUTPUT A 1
INVERTING INPUT A 2
NON-INVERTING INPUT A 3
V⁻ 4
8 V⁺
7 OUTPUT B
6 INVERTING INPUT B
5 NON-INVERTING INPUT B
A
B

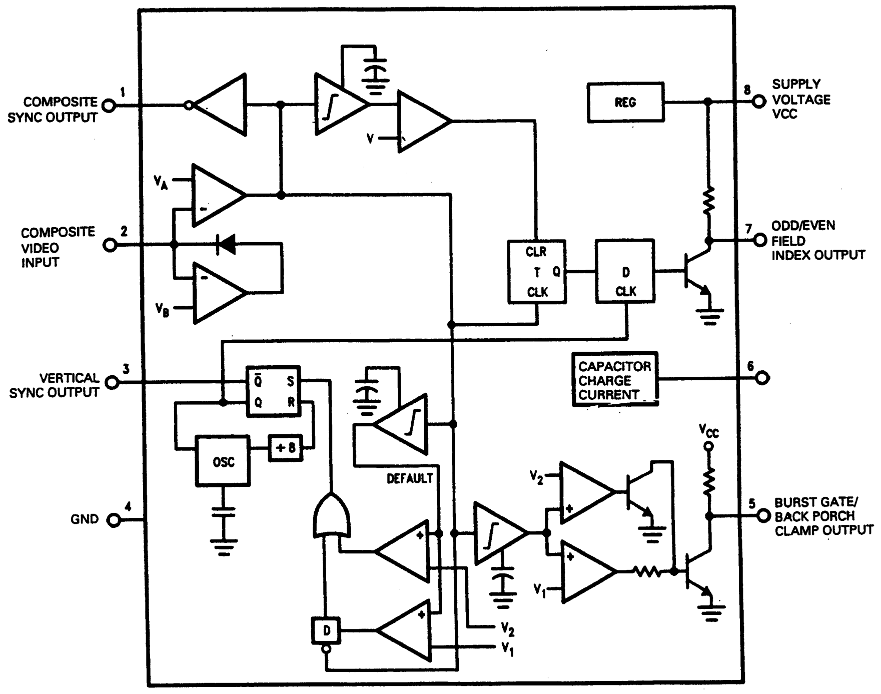
Top View

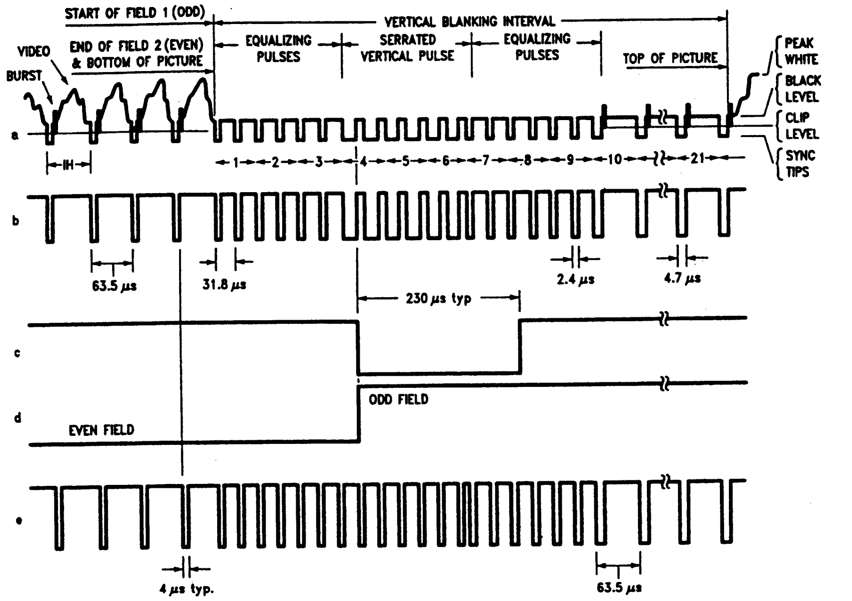
■ M5222FP-XE 【MITSUBISHI】
(VCA)


OUTPUT 1 1
INPUT 1 2
COMMON 3
GND 4
ch 1
ch 2
8 VDD
7 OUTPUT 2
6 INPUT 2
5 CTL (Vc)

Top View

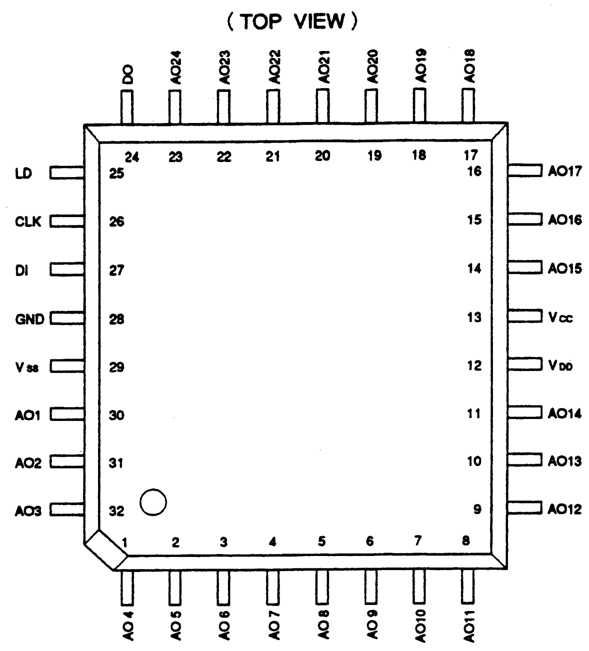
■ LM1881M-X 【National Semiconductor】
(Video Sync Separator)

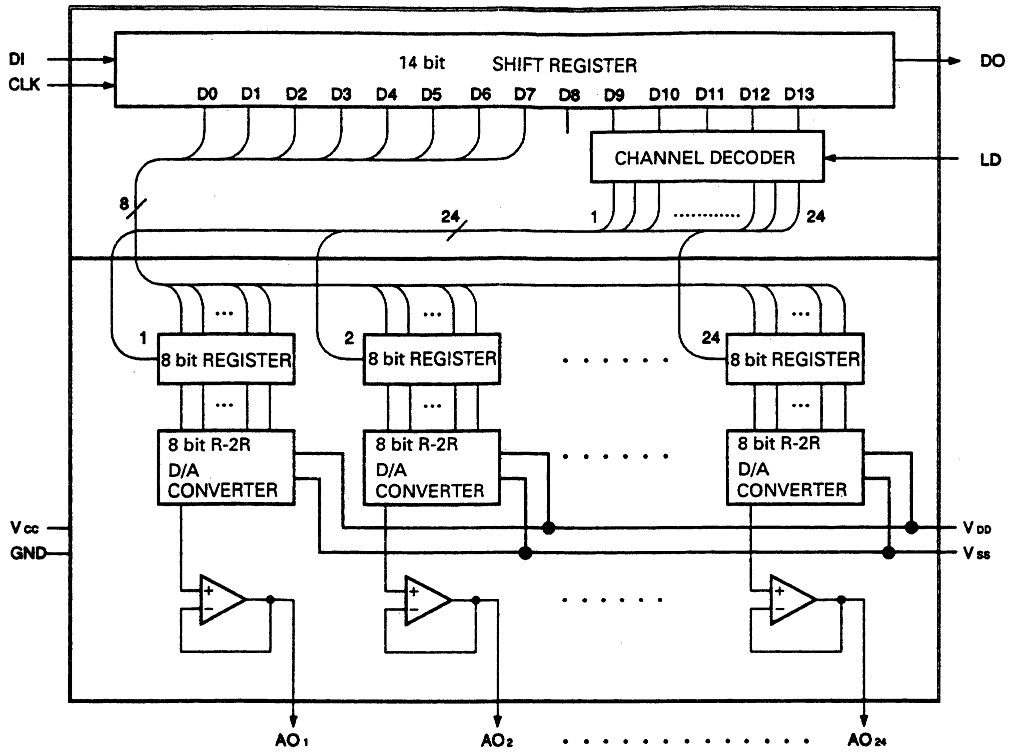

COMPOSITE SYNC OUTPUT 1
COMPOSITE VIDEO INPUT 2
VERTICAL SYNC OUTPUT 3
GND 4
5 BURST GATE/ BACK PORCH CLAMP OUTPUT
6
7 ODD/EVEN FIELD INDEX OUTPUT
8 SUPPLY VOLTAGE VCC
REG
CLR T Q CLK
D CLK
CAPACITOR CHARGE CURRENT
Q̄ S Q R
OSC
÷8
DEFAULT
D
V_A
V_B
V_1
V_2
V_{CC}


START OF FIELD 1 (ODD)
VERTICAL BLANKING INTERVAL
VIDEO
BURST
END OF FIELD 2 (EVEN) & BOTTOM OF PICTURE
EQUALIZING PULSES
SERRATED VERTICAL PULSE
EQUALIZING PULSES
TOP OF PICTURE
PEAK WHITE
BLACK LEVEL
CLIP LEVEL
SYNC TIPS
a
IH
1 2 3 4 5 6 7 8 9 10 21
b
63.5 µs
31.8 µs
2.4 µs
4.7 µs
230 µs typ
c
d
ODD FIELD
EVEN FIELD
e
4 µs typ.
63.5 µs

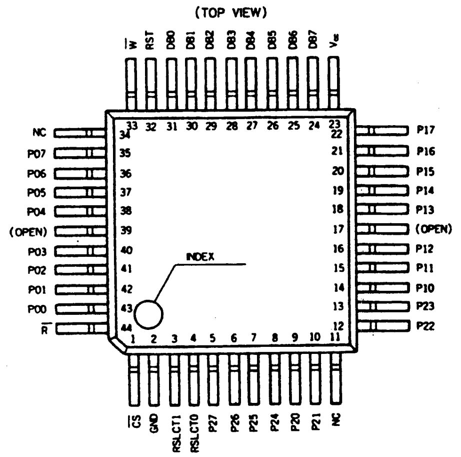
(a) Composite Video; (b) Composite Sync; (c) Vertical Output Pulse; (d) Odd/Even Field Index; (e) Burst Gate/Back Porch Clamp

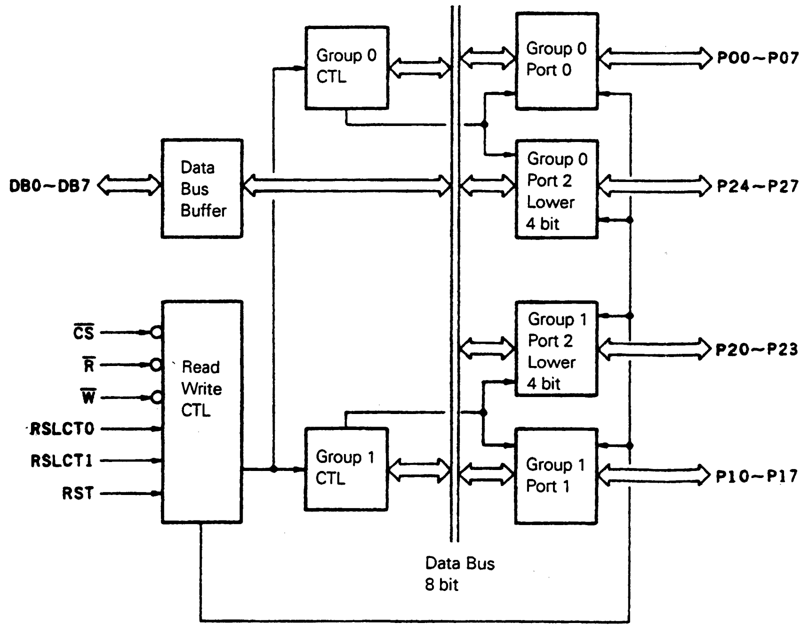
■ MB88345PF 【FUJITSU】
(D/A Converter)


(TOP VIEW)
DO AO24 AO23 AO22 AO21 AO20 AO19 AO18
24 23 22 21 20 19 18 17
LD 25
CLK 26
DI 27
GND 28
Vss 29
AO1 30
AO2 31
AO3 32
16 AO17
15 AO16
14 AO15
13 Vcc
12 VDD
11 AO14
10 AO13
9 AO12
1 2 3 4 5 6 7 8
AO4 AO5 AO6 AO7 AO8 AO9 AO10 AO11

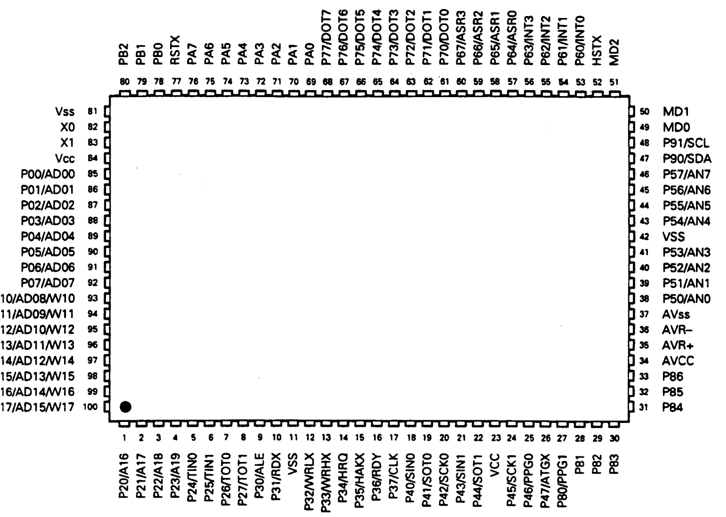

DI
CLK
14 bit SHIFT REGISTER
DO
D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13
CHANNEL DECODER
LD
8
24
1 24
1
2
24
8 bit REGISTER
8 bit REGISTER
8 bit REGISTER
8 bit R-2R D/A CONVERTER
8 bit R-2R D/A CONVERTER
8 bit R-2R D/A CONVERTER
Vcc
GND
VDD
Vss
AO1
AO2
AO24

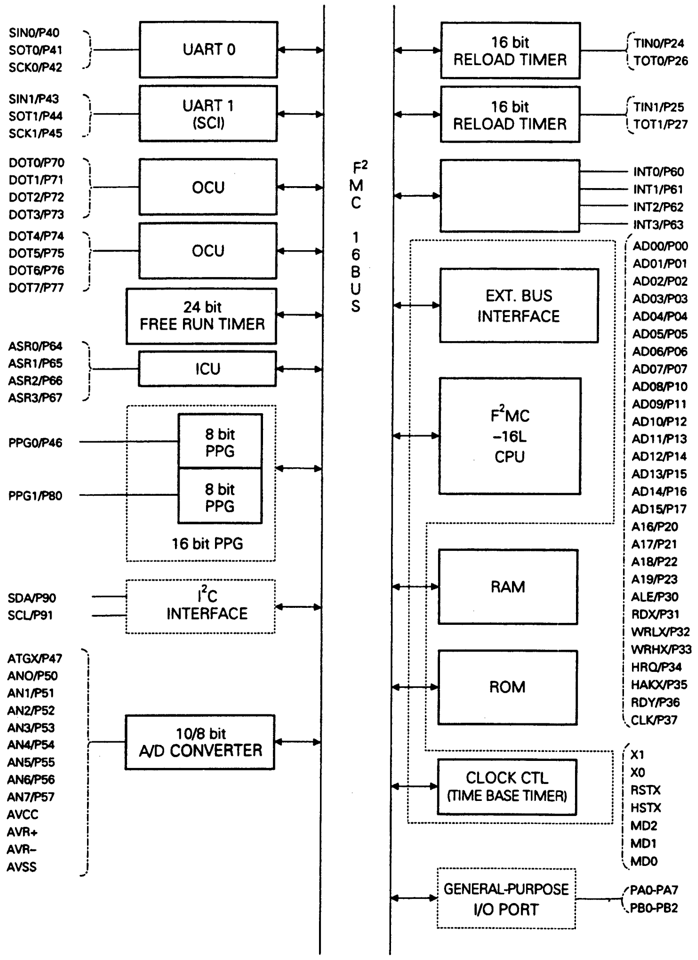
■ MB89255BH-PF 【FUJITSU】
(Paralel Data I/O Interface)


(TOP VIEW)
W̄ RST DB0 DB1 DB2 DB3 DB4 DB5 DB6 DB7 Vcc
33 32 31 30 29 28 27 26 25 24 23
NC 34
P07 35
P06 36
P05 37
P04 38
(OPEN) 39
P03 40
P02 41
P01 42
P00 43
R̄ 44
22 P17
21 P16
20 P15
19 P14
18 P13
17 (OPEN)
16 P12
15 P11
14 P10
13 P23
12 P22
INDEX
1 2 3 4 5 6 7 8 9 10 11
CS̄ GND RSLCT1 RSLCT0 P27 P26 P25 P24 P20 P21 NC

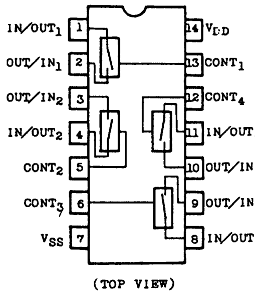

Group 0 CTL
Group 0 Port 0
P00~P07
DB0~DB7
Data Bus Buffer
Group 0 Port 2 Lower 4 bit
P24~P27
CS̄
R̄
W̄
RSLCT0
RSLCT1
RST
Read Write CTL
Group 1 Port 2 Lower 4 bit
P20~P23
Group 1 CTL
Group 1 Port 1
P10~P17
Data Bus 8 bit

■ MB90T678PF 【MITSUBISHI】
(CPU)


PB2 80
PB1 79
PB0 78
RSTX 77
PA7 76
PA6 75
PA5 74
PA4 73
PA3 72
PA2 71
PA1 70
PA0 69
P77/DOT7 68
P76/DOT6 67
P75/DOT5 66
P74/DOT4 65
P73/DOT3 64
P72/DOT2 63
P71/DOT1 62
P70/DOT0 61
P67/ASR3 60
P66/ASR2 59
P65/ASR1 58
P64/ASR0 57
P63/INT3 56
P62/INT2 55
P61/INT1 54
P60/INT0 53
HSTX 52
MD2 51
Vss 81
X0 82
X1 83
Vcc 84
P00/AD00 85
P01/AD01 86
P02/AD02 87
P03/AD03 88
P04/AD04 89
P05/AD05 90
P06/AD06 91
P07/AD07 92
P10/AD08/W10 93
P11/AD09/W11 94
P12/AD10/W12 95
P13/AD11/W13 96
P14/AD12/W14 97
P15/AD13/W15 98
P16/AD14/W16 99
P17/AD15/W17 100
50 MD1
49 MD0
48 P91/SCL
47 P90/SDA
46 P57/AN7
45 P56/AN6
44 P55/AN5
43 P54/AN4
42 VSS
41 P53/AN3
40 P52/AN2
39 P51/AN1
38 P50/AN0
37 AVss
36 AVR-
35 AVR+
34 AVCC
33 P86
32 P85
31 P84
1 P20/A16
2 P21/A17
3 P22/A18
4 P23/A19
5 P24/TIN0
6 P25/TIN1
7 P26/TOT0
8 P27/TOT1
9 P30/ALE
10 P31/RDX
11 VSS
12 P32/WRLX
13 P33/WRHX
14 P34/HRQ
15 P35/HAKX
16 P36/RDY
17 P37/CLK
18 P40/SIN0
19 P41/SOT0
20 P42/SCK0
21 P43/SIN1
22 P44/SOT1
23 VCC
24 P45/SCK1
25 P46/PPG0
26 P47/ATGX
27 P80/PPG1
28 P81
29 P82
30 P83


SIN0/P40
SOT0/P41
SCK0/P42
UART 0
SIN1/P43
SOT1/P44
SCK1/P45
UART 1 (SCI)
DOT0/P70
DOT1/P71
DOT2/P72
DOT3/P73
OCU
DOT4/P74
DOT5/P75
DOT6/P76
DOT7/P77
OCU
24 bit FREE RUN TIMER
ASR0/P64
ASR1/P65
ASR2/P66
ASR3/P67
ICU
PPG0/P46
8 bit PPG
PPG1/P80
8 bit PPG
16 bit PPG
SDA/P90
SCL/P91
I²C INTERFACE
ATGX/P47
AN0/P50
AN1/P51
AN2/P52
AN3/P53
AN4/P54
AN5/P55
AN6/P56
AN7/P57
AVCC
AVR+
AVR-
AVSS
10/8 bit A/D CONVERTER
F² MC 16 BUS
16 bit RELOAD TIMER
TIN0/P24
TOT0/P26
16 bit RELOAD TIMER
TIN1/P25
TOT1/P27
INT0/P60
INT1/P61
INT2/P62
INT3/P63
EXT. BUS INTERFACE
F²MC -16L CPU
AD00/P00
AD01/P01
AD02/P02
AD03/P03
AD04/P04
AD05/P05
AD06/P06
AD07/P07
AD08/P10
AD09/P11
AD10/P12
AD11/P13
AD12/P14
AD13/P15
AD14/P16
AD15/P17
A16/P20
A17/P21
A18/P22
A19/P23
ALE/P30
RDX/P31
WRLX/P32
WRHX/P33
HRQ/P34
HAKX/P35
RDY/P36
CLK/P37
RAM
ROM
CLOCK CTL (TIME BASE TIMER)
X1
X0
RSTX
HSTX
MD2
MD1
MD0
GENERAL-PURPOSE I/O PORT
PA0-PA7
PB0-PB2

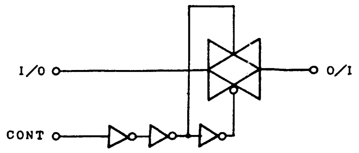
■ MC14066BF-X 【MOTOROLA】
(Quad Bilateral Switch)


IN/OUT₁ 1
OUT/IN₁ 2
OUT/IN₂ 3
IN/OUT₂ 4
CONT₂ 5
CONT₃ 6
Vss 7
14 VDD
13 CONT₁
12 CONT₄
11 IN/OUT₄
10 OUT/IN₄
9 OUT/IN₃
8 IN/OUT₃
(TOP VIEW)

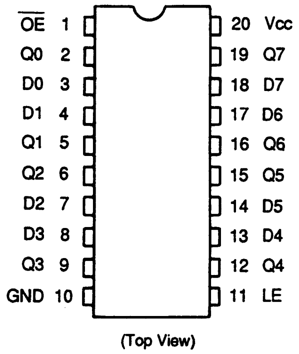
TRUTH TABLE

CONTROL	Impedance Between IN/OUT-OUT/IN *
H	$0.5 \sim 5 \times 10^2 \Omega$
L	$> 10^9 \Omega$

LOGIC DIAGRAM



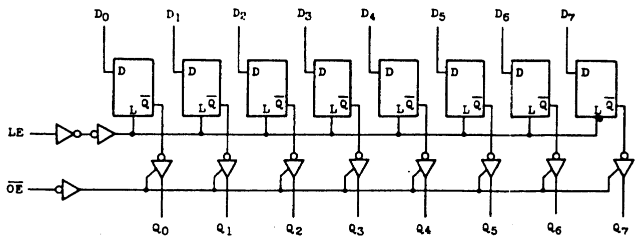
■ MC74HC373AF-X 【MOTOROLA】
(Octal D-Type Latch With NON-Inverted 3-State Output)


OE 1
Q0 2
D0 3
D1 4
Q1 5
Q2 6
D2 7
D3 8
Q3 9
GND 10
20 Vcc
19 Q7
18 D7
17 D6
16 Q6
15 Q5
14 D5
13 D4
12 Q4
11 LE
(Top View)

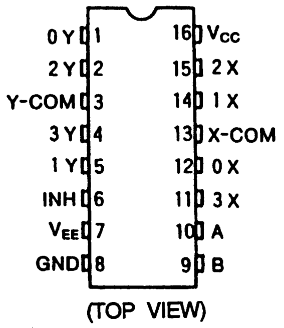
TRUE Table

INPUTS			OUTPUTS
OE	LE	D	
H	X	X	Z
L	L	X	Q_n
L	H	L	L
L	H	H	H

X : Don't Care
Z : Hi impedance
Qn : Q output level before the LE become "L".


D0
D1
D2
D3
D4
D5
D6
D7
D
L
Q
LE
OE
Q0
Q1
Q2
Q3
Q4
Q5
Q6
Q7

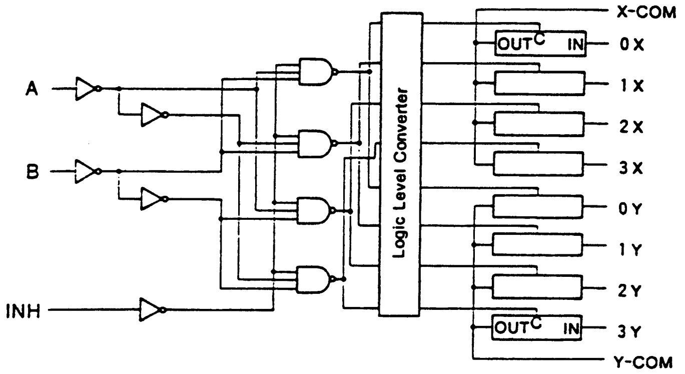
■ MC74HC4052F-X 【MOTOROLA】
(Dual 4-Channel Analog Multiplexer)


0 Y 1
2 Y 2
Y-COM 3
3 Y 4
1 Y 5
INH 6
VEE 7
GND 8
16 Vcc
15 2 X
14 1 X
13 X-COM
12 0 X
11 3 X
10 A
9 B
(TOP VIEW)

TRUE Table

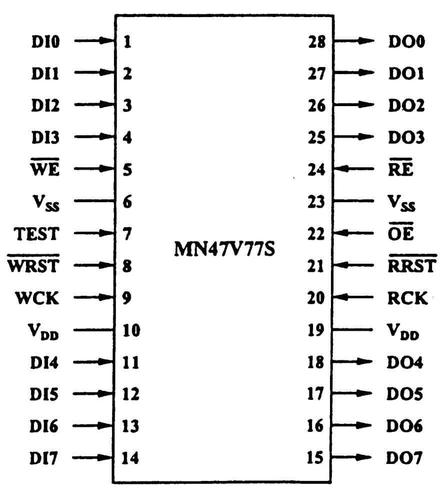
CONTROL INPUTS			"ON" CHANNEL
INHIBIT	B	A	HC4052A
L	L	L	0X, 0Y
L	L	H	1X, 1Y
L	H	L	2X, 2Y
L	H	H	3X, 3Y
H	X	X	NONE

X : DON'T CARE


A
B
INH
Logic Level Converter
X-COM
OUT C IN
0 X
1 X
2 X
3 X
0 Y
1 Y
2 Y
3 Y
OUT C IN
Y-COM

■ MN47V77S-XE 【MATSUSHITA】
(256K-word x 8-bit FIFO Memory)

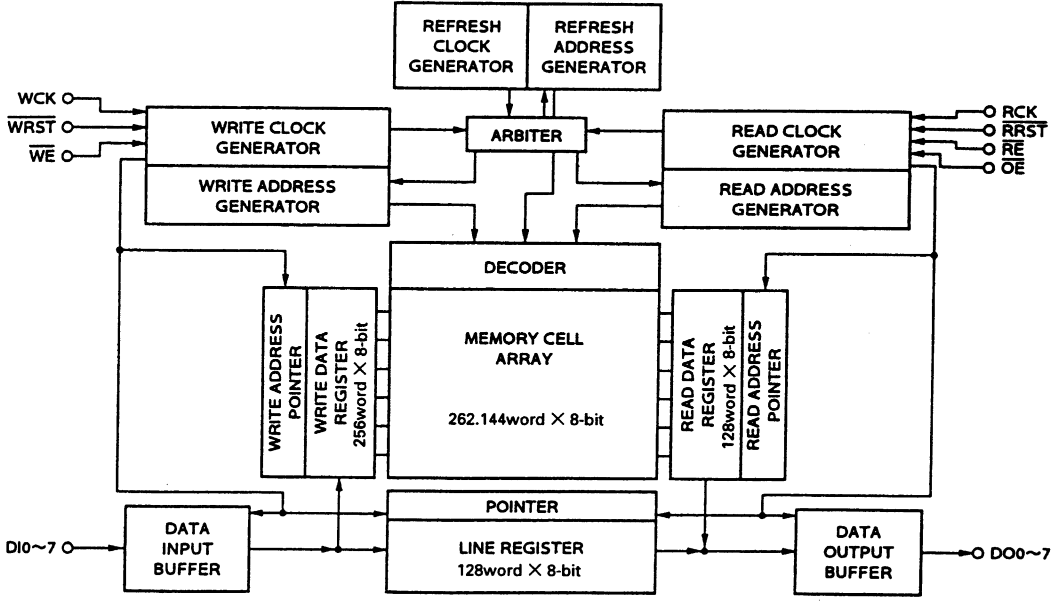
Top View


DI0 1
DI1 2
DI2 3
DI3 4
WE 5
Vss 6
TEST 7
WRST 8
WCK 9
VDD 10
DI4 11
DI5 12
DI6 13
DI7 14
MN47V77S
28 DO0
27 DO1
26 DO2
25 DO3
24 RE
23 Vss
22 OE
21 RRST
20 RCK
19 VDD
18 DO4
17 DO5
16 DO6
15 DO7

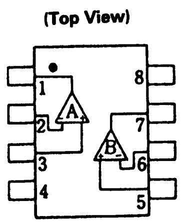
Pin Name

Symbol	Pin Name	Symbol	Pin Name
WCK	Write Clock	OE	Output Enable
RCK	Read Clock	DI0-7	Data Input
WRST	Write Reset	DO0-7	Data Output
RRST	Read Reset	VDD	Power Supply (+3.3V)
WE	Write Enable	Vss	Power Supply (0V)
RE	Read Enable	TEST	Test terminal

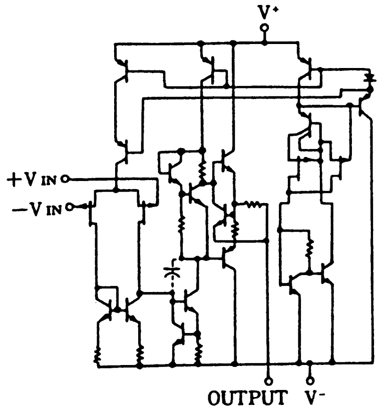
Block Diagram


REFRESH CLOCK GENERATOR
REFRESH ADDRESS GENERATOR
WCK
WRST
WE
WRITE CLOCK GENERATOR
WRITE ADDRESS GENERATOR
ARBITER
READ CLOCK GENERATOR
READ ADDRESS GENERATOR
RCK
RRST
RE
OE
DECODER
WRITE ADDRESS POINTER
WRITE DATA REGISTER 256word X 8-bit
MEMORY CELL ARRAY
262.144word X 8-bit
READ DATA REGISTER 128word X 8-bit
READ ADDRESS POINTER
POINTER
LINE REGISTER 128word X 8-bit
DI0~7
DATA INPUT BUFFER
DATA OUTPUT BUFFER
DO0~7

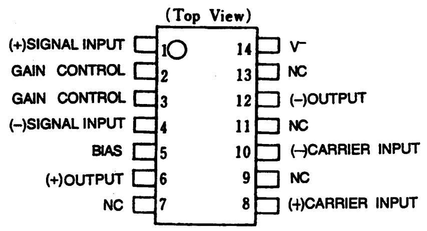
■ NJM062M-X 【JRC】
(J-FET Input Op.Amp)

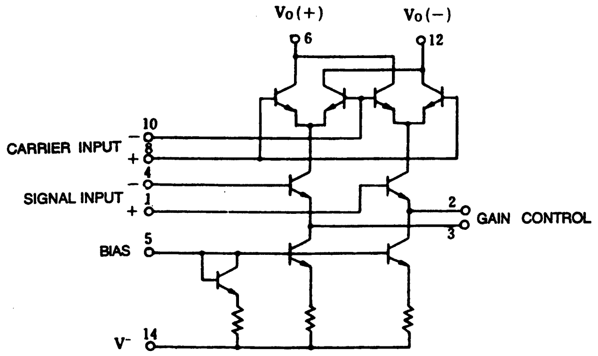

(Top View)
1
2
3
4
5
6
7
8
A
B

1. A OUTPUT
2. A−INPUT
3. A+INPUT
4. V⁻
5. B+INPUT
6. B−INPUT
7. B OUTPUT
8. V⁺

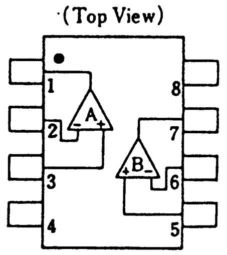

V⁺
+V IN
−V IN
OUTPUT
V⁻

■ NJM1496M-X 【JRC】
(Balanced Modulator)

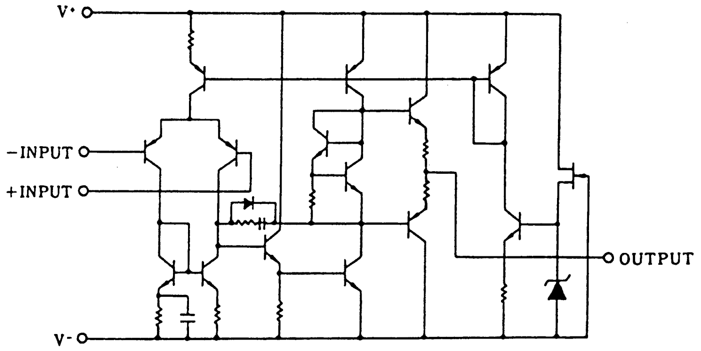

(Top View)
(+)SIGNAL INPUT 1
GAIN CONTROL 2
GAIN CONTROL 3
(−)SIGNAL INPUT 4
BIAS 5
(+)OUTPUT 6
NC 7
14 V⁻
13 NC
12 (−)OUTPUT
11 NC
10 (−)CARRIER INPUT
9 NC
8 (+)CARRIER INPUT


Vo(+)
6
Vo(−)
12
CARRIER INPUT
10
8
SIGNAL INPUT
4
1
BIAS
5
2
3
GAIN CONTROL
V⁻
14

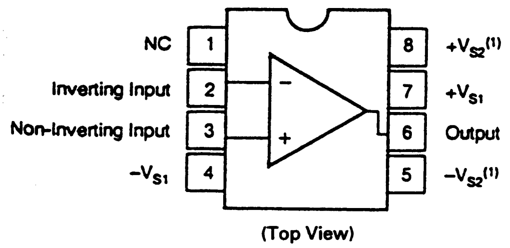
■ NJM2068M-D-X 【JRC】
(Dual Low-Noise Op.Amp)


(Top View)
1
2
3
4
5
6
7
8
A
B

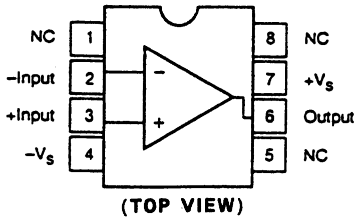
1. A OUTPUT
2. A−INPUT
3. A+INPUT
4. V⁻
5. B+INPUT
6. B−INPUT
7. B OUTPUT
8. V⁺


V⁺
−INPUT
+INPUT
OUTPUT
V⁻

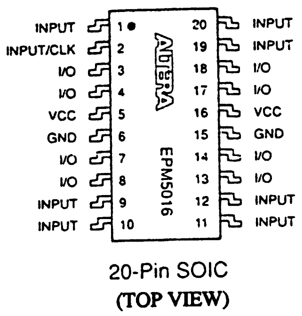
■ OPA655U-XE 【BBJ】
(Op.Amplifier)

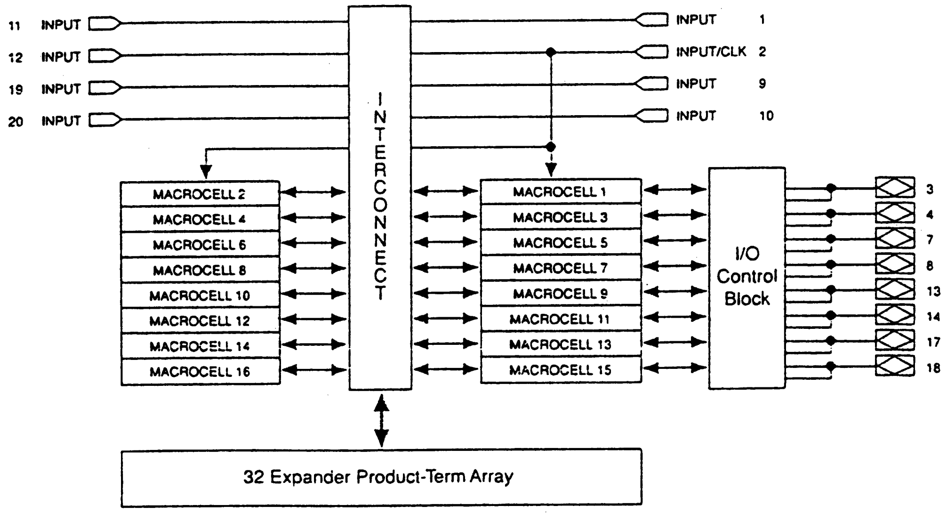

NC 1
Inverting Input 2
Non-Inverting Input 3
−V S1 4
8 +V S2 (1)
7 +V S1
6 Output
5 −V S2 (1)
−
+
(Top View)

■ OPA658U-XE 【BBJ】
(Op.Amplifier)

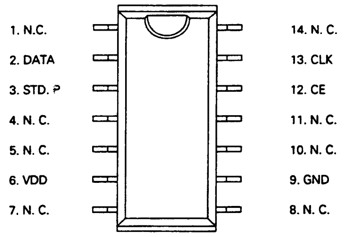

NC 1
−Input 2
+Input 3
−V S 4
8 NC
7 +V S
6 Output
5 NC
−
+
(TOP VIEW)

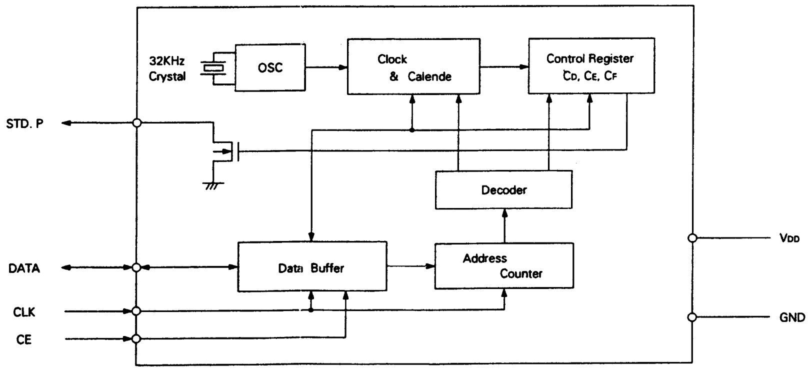
■ PL5016-15-003-2 【ALTERA】
(Electlical Eracable Programable Logic Devices)


INPUT 1
INPUT/CLK 2
I/O 3
I/O 4
VCC 5
GND 6
I/O 7
I/O 8
INPUT 9
INPUT 10
20 INPUT
19 INPUT
18 I/O
17 I/O
16 VCC
15 GND
14 I/O
13 I/O
12 INPUT
11 INPUT
ALTERA
EPM5016
20-Pin SOIC
(TOP VIEW)

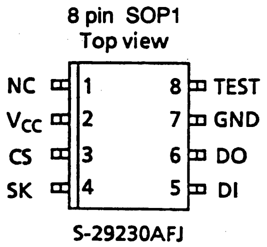

11 INPUT
12 INPUT
19 INPUT
20 INPUT
INPUT 1
INPUT/CLK 2
INPUT 9
INPUT 10
INTERCONNECT
MACROCELL 2
MACROCELL 4
MACROCELL 6
MACROCELL 8
MACROCELL 10
MACROCELL 12
MACROCELL 14
MACROCELL 16
MACROCELL 1
MACROCELL 3
MACROCELL 5
MACROCELL 7
MACROCELL 9
MACROCELL 11
MACROCELL 13
MACROCELL 15
I/O Control Block
3
4
7
8
13
14
17
18
32 Expander Product-Term Array

■ RTC-4513A 【EPSON】
(Real Time Clock)


1. N.C.
2. DATA
3. STD. P
4. N. C.
5. N. C.
6. VDD
7. N. C.
14. N. C.
13. CLK
12. CE
11. N. C.
10. N. C.
9. GND
8. N. C.


32KHz Crystal
OSC
Clock & Calende
Control Register CD, CE, CF
Decoder
Data Buffer
Address Counter
STD. P
DATA
CLK
CE
VDD
GND

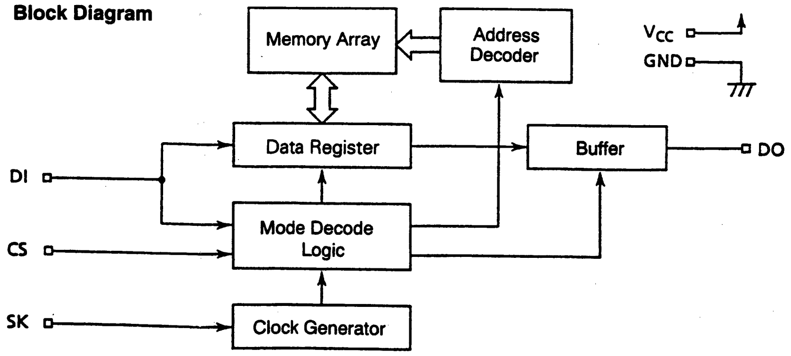
■ S-29230AFJ-X 【SEIKO】
(C-MOS 2K-bit EEPROM)


8 pin SOP1
Top view
NC 1
Vcc 2
CS 3
SK 4
8 TEST
7 GND
6 DO
5 DI
S-29230AFJ

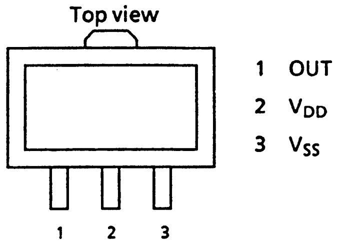
Pin Function

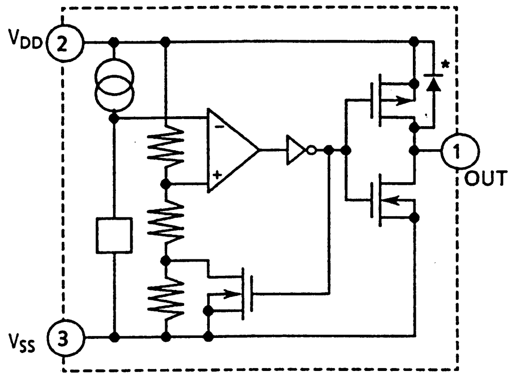
Pin Name	Pin No.		Function
	DIP	SOP1	
CS	1	3	Chip Select Input
SK	2	4	Serial Clock Input
DI	3	5	Serial Data Input
DO	4	6	Serial Data Output
GND	5	7	GND
TEST	6	8	Test : Open
NC	7	1	No Connect
Vcc	8	2	Power Supply

Block Diagram

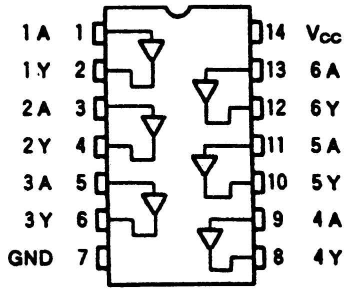

Memory Array
Address Decoder
Vcc
GND
Data Register
Buffer
DO
DI
CS
Mode Decode Logic
SK
Clock Generator

■ S-8054HN-CB-X 【SEIKO INSTRUMENTS】
(C-MOS Voltage Detector)


Top view
1 OUT
2 VDD
3 VSS
1
2
3

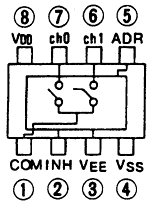

VDD
2
1
OUT
VSS
3
*

■ SN74LS07DB-XE 【TEXAS】
(Hex Buffers)


1A 1
1Y 2
2A 3
2Y 4
3A 5
3Y 6
GND 7
14 Vcc
13 6A
12 6Y
11 5A
10 5Y
9 4A
8 4Y

(TOP VIEW)

■ TC4W53F-X 【TOSHIBA】
(2-Channel Multiplexer)

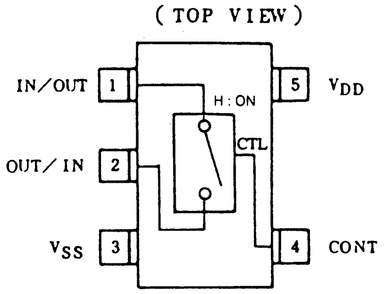

⑧ ⑦ ⑥ ⑤
VDD ch0 ch1 ADR
COM INH VEE VSS
① ② ③ ④

TRUE TABLE

CONTROL INPUT		ON CHANNEL
INH	ADR	
L	L	ch0
L	H	ch1
H	*	NONE

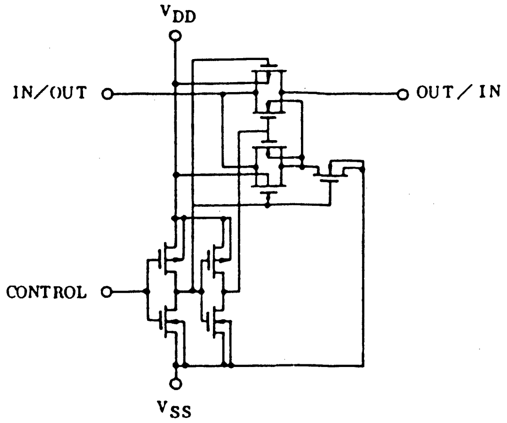
*Don't care

■ TC4S66F-X 【TOSHIBA】
(Bilateral Switch)

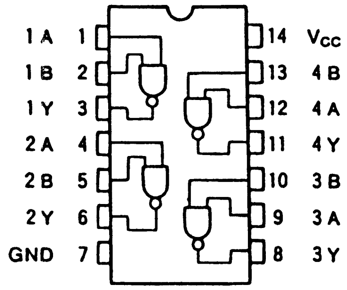

(TOP VIEW)
IN/OUT 1
OUT/IN 2
VSS 3
5 VDD
4 CONT
H : ON
CTL

CONTROL	IMPEDANCE BETWEEN IN/OUT-OUT/IN ※
H	0.5 ~ 5 × 10^2 Ω
L	> 10^9 Ω

※ See Electrical Characteristics


VDD
IN/OUT
OUT/IN
CONTROL
VSS

■ TC74HC00AF-X 【TOSHIBA】
(Quad 2-Input NAND Gates)

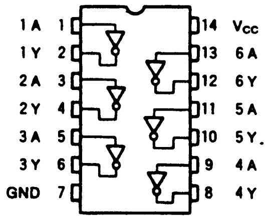

1A 1
1B 2
1Y 3
2A 4
2B 5
2Y 6
GND 7
14 Vcc
13 4B
12 4A
11 4Y
10 3B
9 3A
8 3Y

(TOP VIEW)

TRUE Table

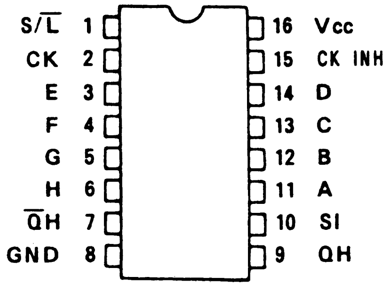
A	B	Y
L	L	H
L	H	H
H	L	H
H	H	L

■ TC74HC04AF-X 【TOSHIBA】
(Hex Inverters)


1A 1
1Y 2
2A 3
2Y 4
3A 5
3Y 6
GND 7
14 Vcc
13 6A
12 6Y
11 5A
10 5Y
9 4A
8 4Y

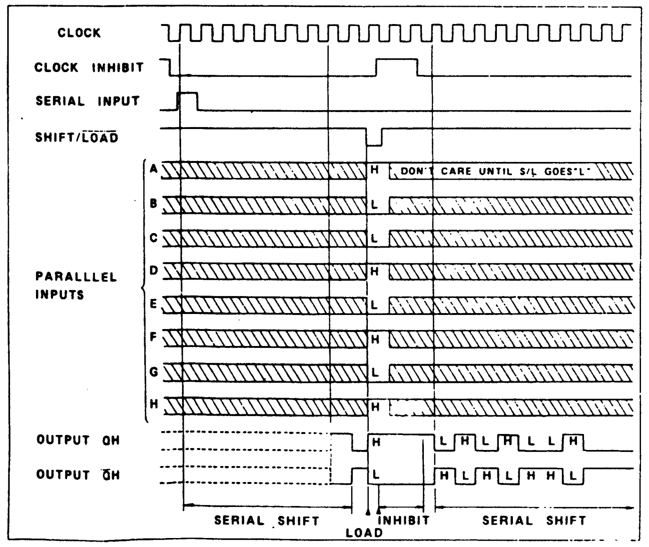
(TOP VIEW)

■ TC74HC165AF-X 【TOSHIBA】
(8-Bit Serial or Parallel-In/Serial Out Shift Registers With Complementary Out)


S/L̄ 1
CK 2
E 3
F 4
G 5
H 6
Q̄H 7
GND 8
16 Vcc
15 CK INH
14 D
13 C
12 B
11 A
10 SI
9 QH

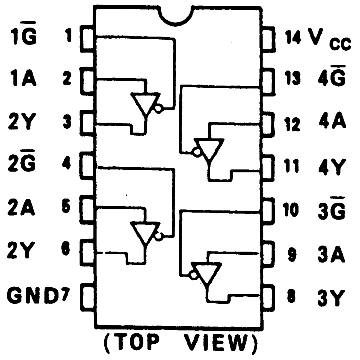
(TOP VIEW)

Timing chart



■ TC74VHC04FS-X 【TOSHIBA】
(Refer to TC74HC04AF-X.)

■ TC74HC125AF-X 【TOSHIBA】
(Quad Bus Buffer Gates With 3-State Outputs)


1Ḡ 1
1A 2
2Y 3
2Ḡ 4
2A 5
2Y 6
GND 7
14 Vcc
13 4Ḡ
12 4A
11 4Y
10 3Ḡ
9 3A
8 3Y

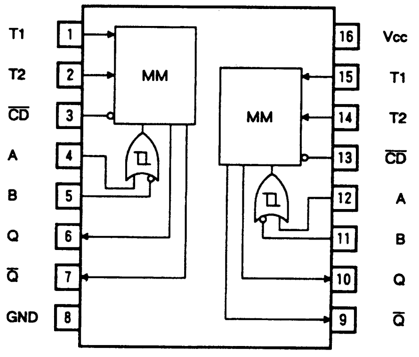
(TOP VIEW)

TC74HC125A TRUE Table

INPUTS		OUTPUTS
Ḡ	A	Y
H	X	Z
L	L	L
L	H	H

X : Don't Care
Z : High Impedance

■ TC74HC4538AFS-X 【TOSHIBA】
(Dual Retriggerable Monostable Multivibrator)

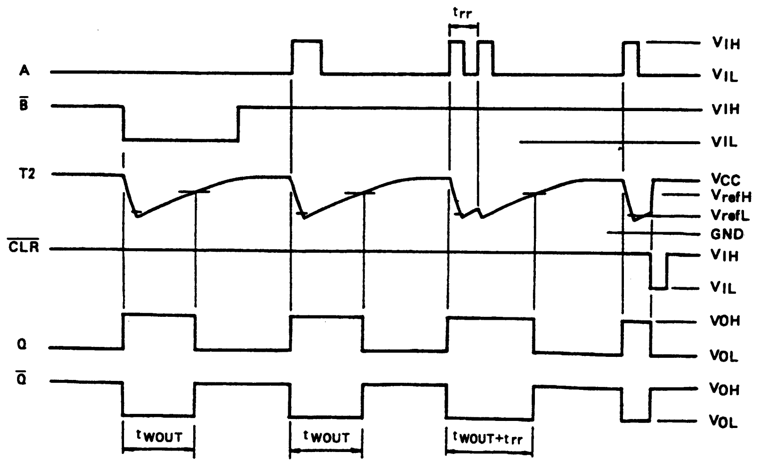

T1 1
T2 2
C̄D̄ 3
A 4
B 5
Q 6
Q̄ 7
GND 8
16 Vcc
15 T1
14 T2
13 C̄D̄
12 A
11 B
10 Q
9 Q̄
MM
MM

TOP VIEW

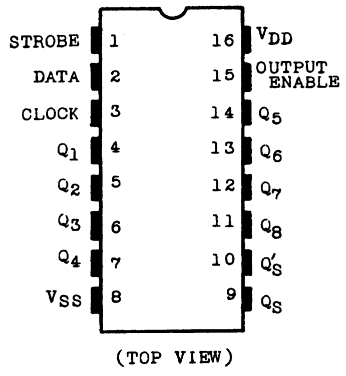
TRUE Table

INPUT			OUTPUT		NOTE
A	B̄	C̄D̄	Q	Q̄	
↑	H	H	⊓	⊔	OUTPUT ENABLE
X	L	H	L	H	INHIBIT
H	X	H	L	H	INHIBIT
L	↓	H	⊓	⊔	OUTPUT ENABLE
X	X	L	L	H	INHIBIT

X:Don't Care



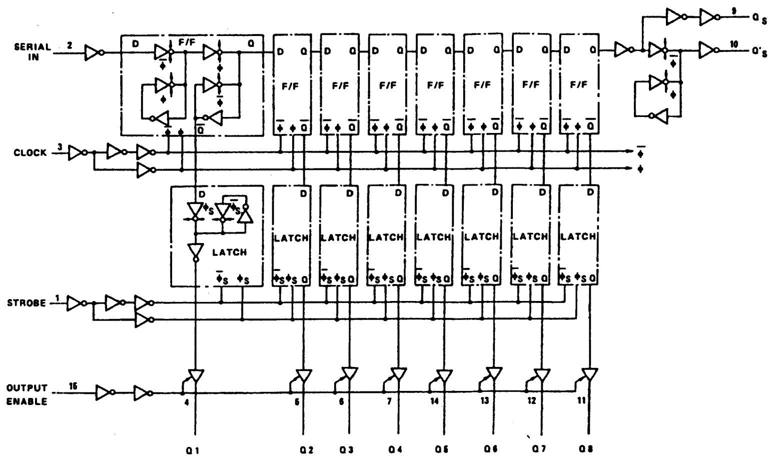
■ TC74HC4094AF-X 【TOSHIBA】
(8 Stage Bus Compatible Shift/Store Register)


STROBE 1
DATA 2
CLOCK 3
Q1 4
Q2 5
Q3 6
Q4 7
VSS 8
16 VDD
15 OUTPUT ENABLE
14 Q5
13 Q6
12 Q7
11 Q8
10 Q'S
9 QS
(TOP VIEW)

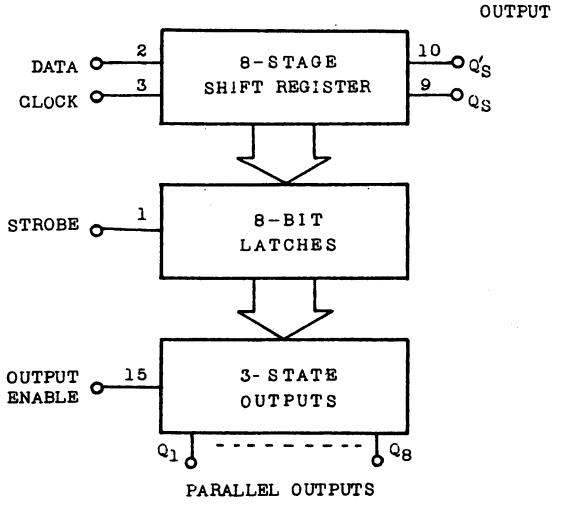
TRUTH TABLE

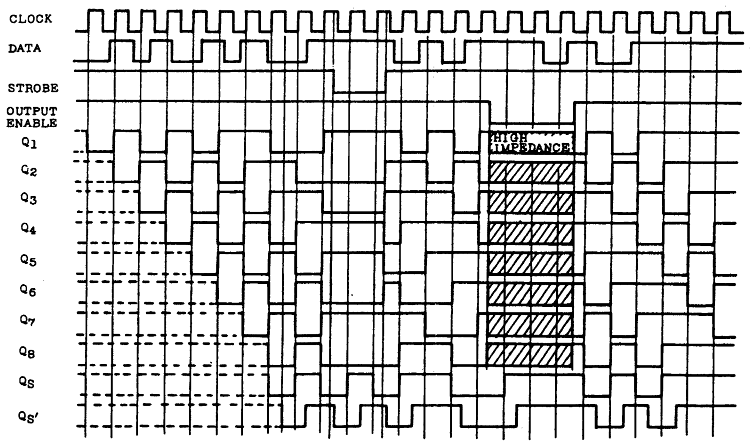
CL	OE	ST	D	PO		SO	
				Q_1	Q_n	Q_S	Q'_S
↑	H	H	L	L	Q_n-1	Q_7	NC
↑	H	H	H	H	Q_n-1	Q_7	NC
↑	H	L	*	NC	NC	Q_7	NC
↑	L	*	*	HZ	HZ	Q_7	NC
↓	H	*	*	NC	NC	NC	Q_S
↓	L	*	*	HZ	HZ	NC	Q_S

CL = Clock
OE = Output Enable
ST = Strobe
D = Data
PO = Parallel Outputs
SO = Serial Output
* = Don't care
NC = No Change
HZ = High Impedance

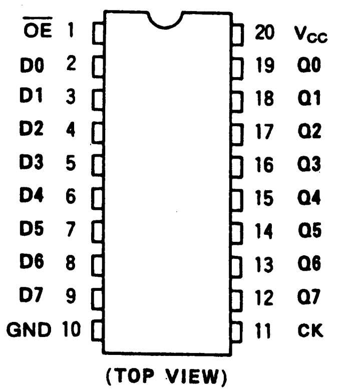

SERIAL IN 2
CLOCK 3
STROBE 1
OUTPUT ENABLE 15
F/F
LATCH
9 QS
10 Q'S
Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8

BLOCK DIAGRAM

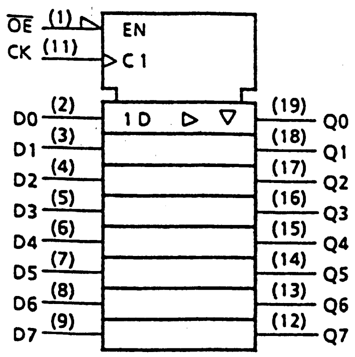

SERIAL OUTPUT
DATA 2
CLOCK 3
8-STAGE SHIFT REGISTER
10 Q'S
9 QS
STROBE 1
8-BIT LATCHES
OUTPUT ENABLE 15
3-STATE OUTPUTS
Q1
Q8
PARALLEL OUTPUTS



■ TC74VHC574FS-X 【TOSHIBA】
(Octal D-Type EDGE-Trigger Flip-Flop With NON Inverted 3-State Outputs)


OE 1
D0 2
D1 3
D2 4
D3 5
D4 6
D5 7
D6 8
D7 9
GND 10
20 Vcc
19 Q0
18 Q1
17 Q2
16 Q3
15 Q4
14 Q5
13 Q6
12 Q7
11 CK
(TOP VIEW)

Logic


OE (1)
CK (11)
EN
C1
1D
D0 (2)
D1 (3)
D2 (4)
D3 (5)
D4 (6)
D5 (7)
D6 (8)
D7 (9)
(19) Q0
(18) Q1
(17) Q2
(16) Q3
(15) Q4
(14) Q5
(13) Q6
(12) Q7

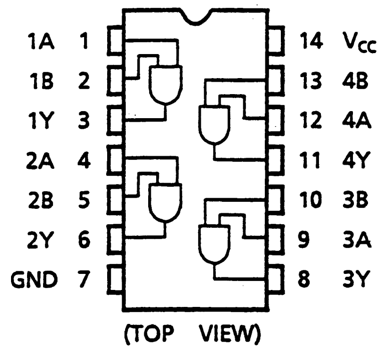
INPUTS			OUTPUT
$\overline{OE}$	CK	D	
H	X	X	Z
L	↓	X	Q_n
L	↑	L	L
L	↑	H	H

X : Don't Care
Z : High Impedance
Qn : No Change

■ TC74VHC125FS-X 【TOSHIBA】
(Refer to TC74HC125AF-X.)

■ TC74VHCT04FS-X 【TOSHIBA】
(Refer to TC74HC04AF-X.)

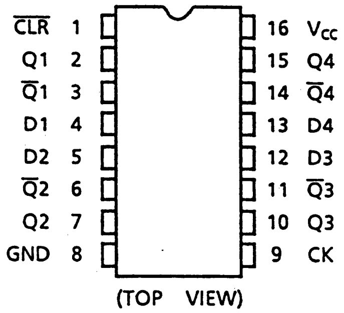
■ TC74VHC08FS-X 【TOSHIBA】
(Quad 2-Input AND Gates)


1A 1
1B 2
1Y 3
2A 4
2B 5
2Y 6
GND 7
14 Vcc
13 4B
12 4A
11 4Y
10 3B
9 3A
8 3Y
(TOP VIEW)

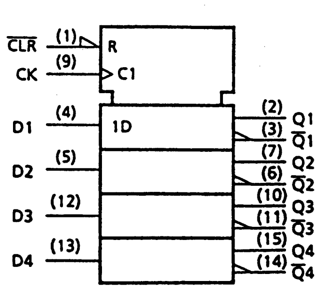
TRUE Table

A	B	Y
L	L	L
L	H	L
H	L	L
H	H	H

■ TC74VHC175FS-X 【TOSHIBA】
(Quad D-type Flip Flop with Clear)


CLR 1
Q1 2
Q̄1 3
D1 4
D2 5
Q̄2 6
Q2 7
GND 8
16 Vcc
15 Q4
14 Q̄4
13 D4
12 D3
11 Q̄3
10 Q3
9 CK
(TOP VIEW)

Logic

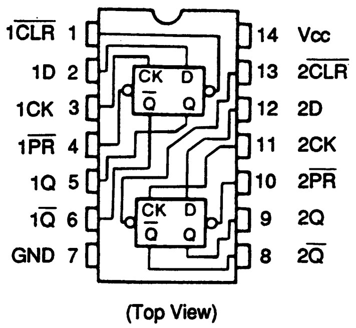

CLR (1)
CK (9)
R
C1
1D
D1 (4)
D2 (5)
D3 (12)
D4 (13)
(2) Q1
(3) Q̄1
(7) Q2
(6) Q̄2
(10) Q3
(11) Q̄3
(15) Q4
(14) Q̄4

True Table

INPUTS			OUTPUTS		FUNCTION
$\overline{CLR}$	D	CK	Q	$\overline{Q}$	
L	X	X	L	H	CLEAR
H	L	↑	L	H	—
H	H	↑	H	L	—
H	X	↓	Q_n	$\overline{Q}_n$	NO CHANGE

X : Don't Care

■ TC74VHC74FS-X 【TOSHIBA】
(Dual D-Type Positive-EDGE-Triggered Flip-Flops With Preset AND Clear)

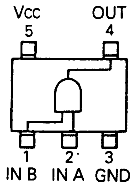

1CLR 1
1D 2
1CK 3
1PR 4
1Q 5
1Q̄ 6
GND 7
14 Vcc
13 2CLR
12 2D
11 2CK
10 2PR
9 2Q
8 2Q̄
CK D
Q Q
(Top View)

TRUE Table

INPUTS				OUTPUTS		FUNCTION
$\overline{CLR}$	$\overline{PR}$	D	CK	Q	$\overline{Q}$	
L	H	X	X	L	H	CLEAR
H	L	X	X	H	L	PRESET
L	L	X	X	H	H	—
H	H	L	↑	L	H	—
H	H	H	↑	H	L	—
H	H	X	↓	Q_n	$\overline{Q}_n$	NO CHANGE

X : Don't care

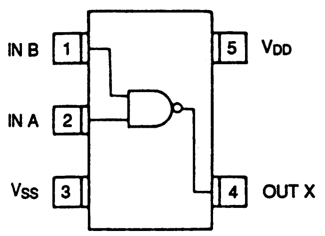
■ TC7S08F-X 【TOSHIBA】
(2 Input Single AND Gate)

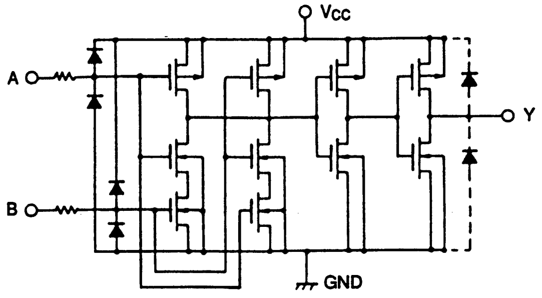

Vcc 5
OUT 4
1 IN B
2 IN A
3 GND

TRUE Table

A	B	X
L	L	L
L	H	L
H	L	L
H	H	H

■ TC7S00F-X 【TOSHIBA】
(2-Input NAND Gate)

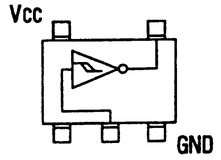

IN B
IN A
Vss
VDD
OUT X
1
2
3
4
5



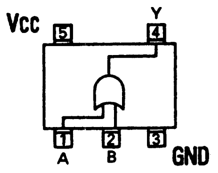
TRUE Table

A	B	X
L	L	H
L	H	H
H	L	H
H	H	L

■ TC7S14F-X 【TOSHIBA】
(Schmitt trigger)



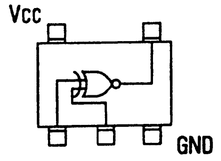
■ TC7SH32FU-X 【TOSHIBA】
(2 Input Single OR Gate)


Vcc
Y
5
4
1
2
3
A
B
GND

TRUE Table

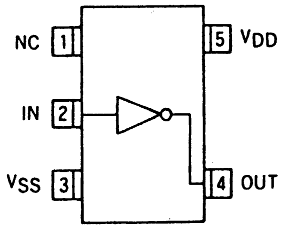
A	B	Y
H	H	H
L	H	H
H	L	H
L	L	L

■ TC7S86F-X 【TOSHIBA】
(Single Exelusive OR Gate)



■ TC7SU04F-X 【TOSHIBA】
(Invertor)

Pin arangement

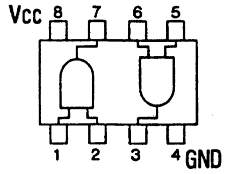

NC
IN
Vss
VDD
OUT
1
2
3
4
5

■ TC7SH00FU-X 【TOSHIBA】
(Refer to TC7S00F-X.)

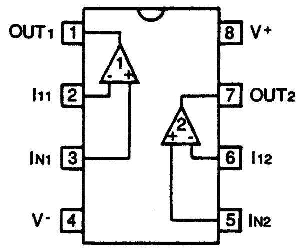
■ TC7SH08FU-X 【TOSHIBA】
(Refer to TC7S08F-X.)

■ TC7SH86FU-X 【TOSHIBA】
(Refer to TC7S86F-X.)

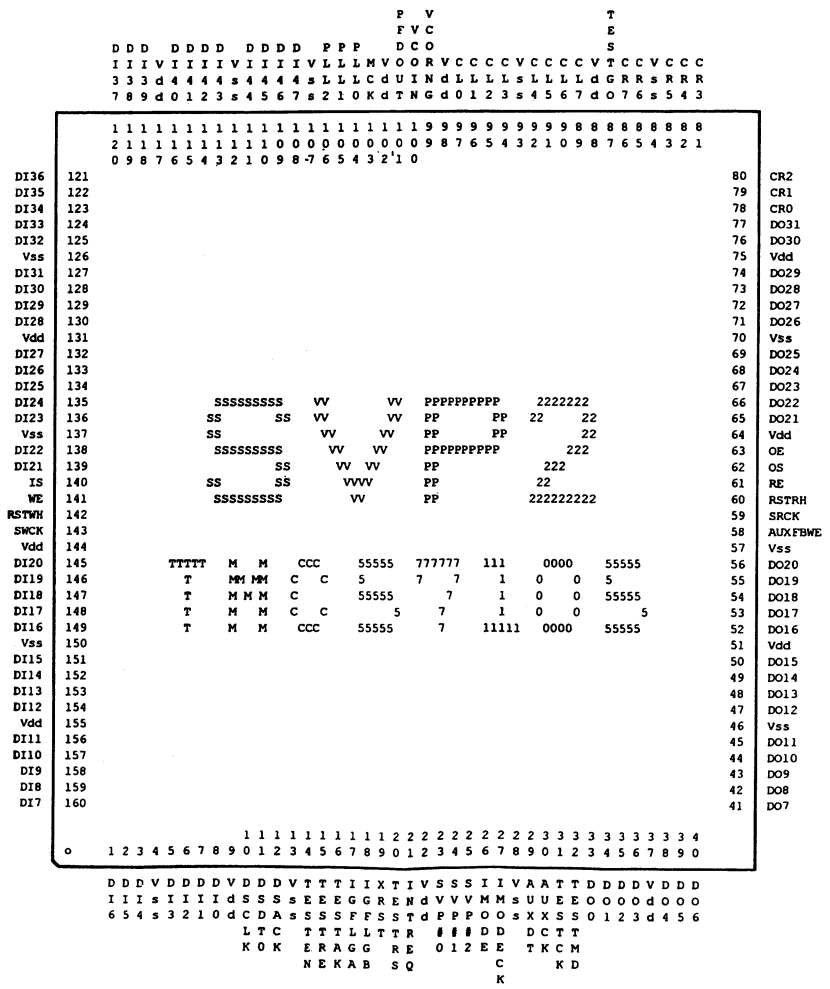
■ TC7W08F-X 【TOSHIBA】
(2 Input Dual AND Gate)


Vcc
8
7
6
5
1
2
3
4
GND

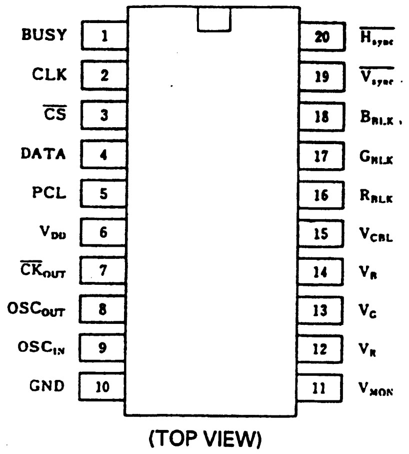
■ UPC812G2-X 【NEC】
(Op.Amp.)

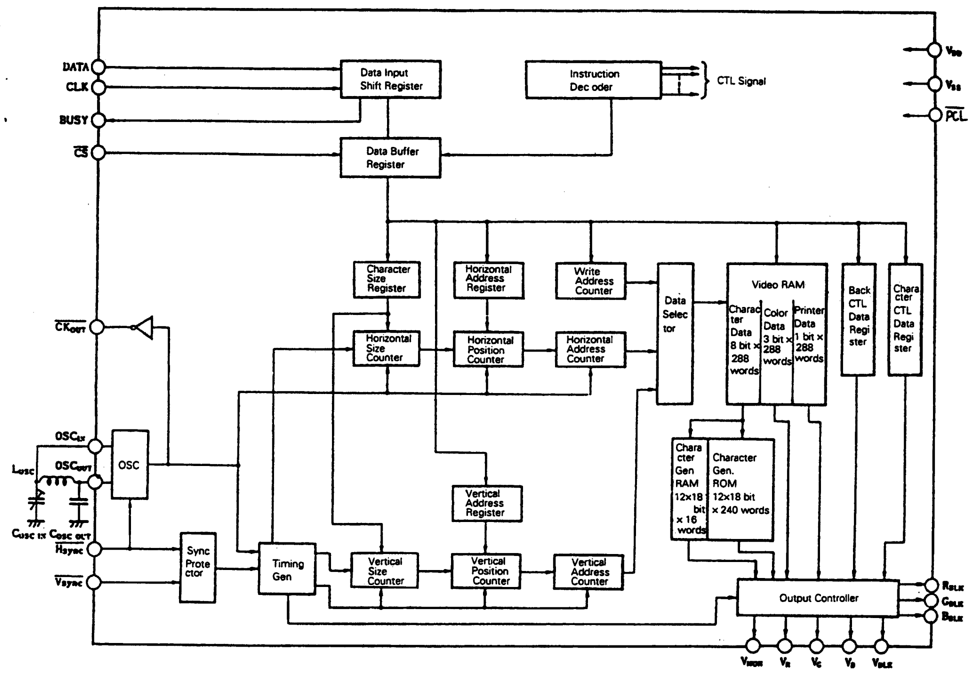

OUT1
I11
IN1
V-
V+
OUT2
I12
IN2
1
2
3
4
5
6
7
8

■ JCS0039 【JVC】
(Scan-line Video Processor)

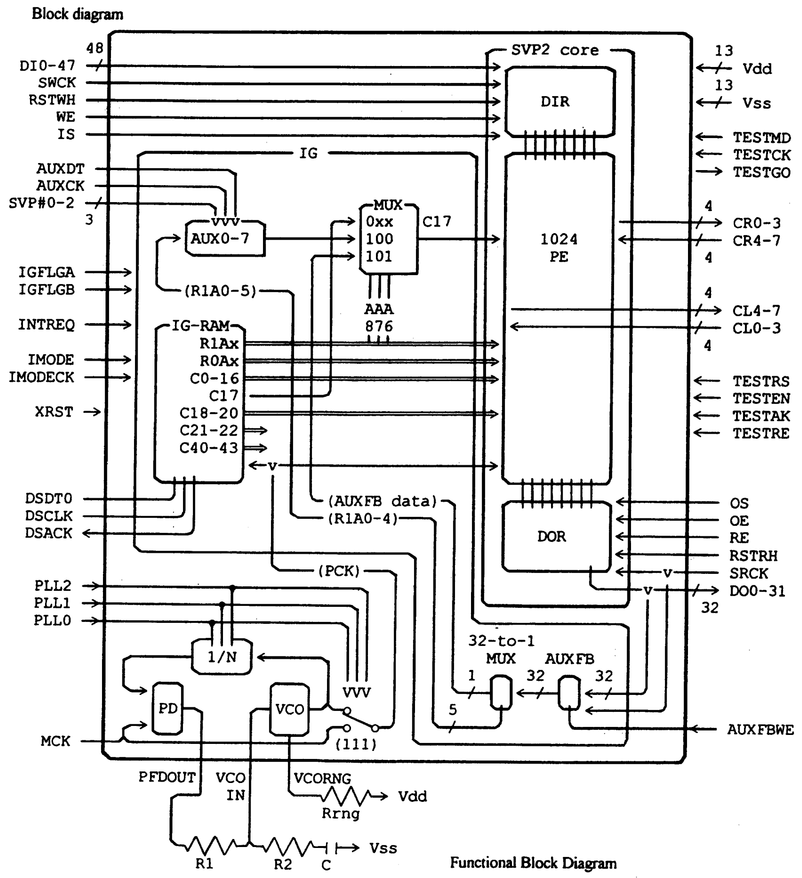

DI36 121
DI35 122
DI34 123
DI33 124
DI32 125
Vss 126
DI31 127
DI30 128
DI29 129
DI28 130
Vdd 131
DI27 132
DI26 133
DI25 134
DI24 135
DI23 136
Vss 137
DI22 138
DI21 139
IS 140
WE 141
RSTWH 142
SWCK 143
Vdd 144
DI20 145
DI19 146
DI18 147
DI17 148
DI16 149
Vss 150
DI15 151
DI14 152
DI13 153
DI12 154
Vdd 155
DI11 156
DI10 157
DI9 158
DI8 159
DI7 160
80 CR2
79 CR1
78 CR0
77 DO31
76 DO30
75 Vdd
74 DO29
73 DO28
72 DO27
71 DO26
70 Vss
69 DO25
68 DO24
67 DO23
66 DO22
65 DO21
64 Vdd
63 OE
62 OS
61 RE
60 RSTRH
59 SRCK
58 AUXFBWE
57 Vss
56 DO20
55 DO19
54 DO18
53 DO17
52 DO16
51 Vdd
50 DO15
49 DO14
48 DO13
47 DO12
46 Vss
45 DO11
44 DO10
43 DO9
42 DO8
41 DO7

■ UPD6453GT-101 【NEC】
(On Screen Charactor Generator)


BUSY 1
CLK 2
CS 3
DATA 4
PCL 5
VDD 6
CKOUT 7
OSCOUT 8
OSCIN 9
GND 10
20 Hsync
19 Vsync
18 BBLK
17 GBLK
16 RBLK
15 VCRL
14 VB
13 VG
12 VR
11 VMON
(TOP VIEW)


DATA
CLK
BUSY
CS
Data Input Shift Register
Instruction Decoder
CTL Signal
VDD
VSS
PCL
Data Buffer Register
Character Size Register
Horizontal Address Register
Write Address Counter
Data Selector
Video RAM
Character Data 8 bit x 288 words
Color Data 3 bit x 288 words
Printer Data 1 bit x 288 words
Back CTL Data Register
Character CTL Data Register
CKOUT
Horizontal Size Counter
Horizontal Position Counter
Horizontal Address Counter
OSCIN
OSCOUT
OSC
Losc
Cosc IN
Cosc OUT
Hsync
Vsync
Sync Protector
Timing Gen
Character Gen RAM 12x18 bit x 16 words
Character Gen. ROM 12x18 bit x 240 words
Vertical Address Register
Vertical Size Counter
Vertical Position Counter
Vertical Address Counter
Output Controller
RBLK
GBLK
BBLK
VMON
VR
VG
VB
VBLK

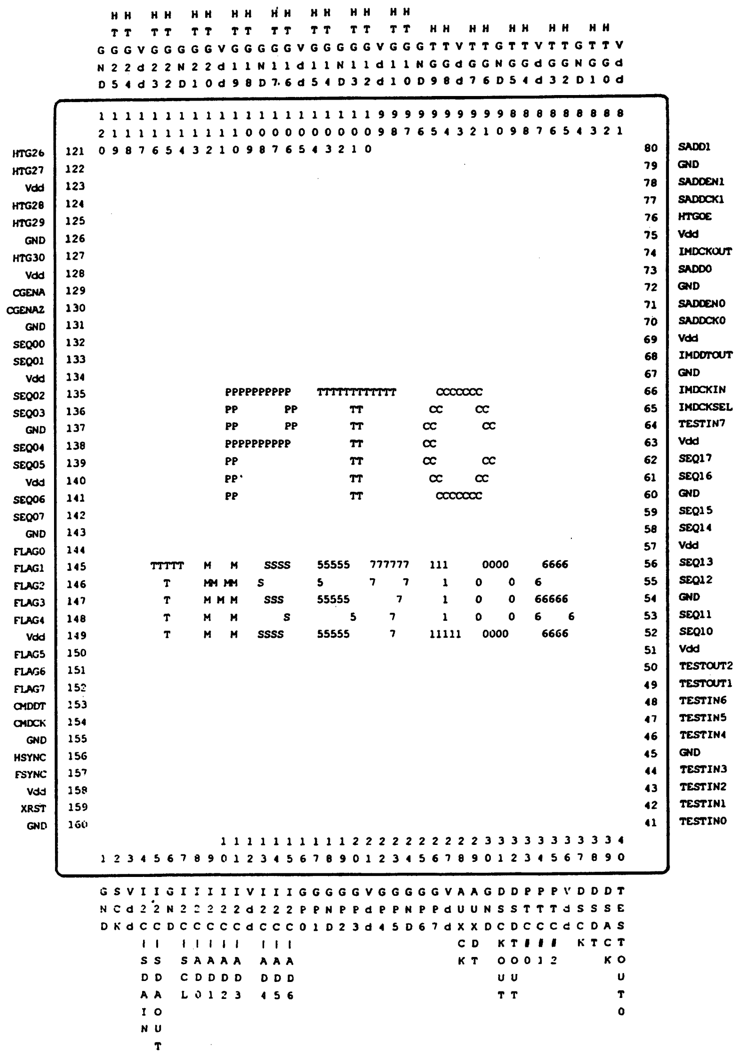
Block diagram


48
DI0-47
SWCK
RSTWH
WE
IS
AUXDT
AUXCK
SVP#0-2
3
IGFLGA
IGFLGB
INTREQ
IMODE
IMODECK
XRST
DSDT0
DSCLK
DSACK
PLL2
PLL1
PLL0
MCK
SVP2 core
DIR
IG
MUX
AUX0-7
0xx
100
101
C17
(R1A0-5)
AAA
876
IG-RAM
R1Ax
R0Ax
C0-16
C17
C18-20
C21-22
C40-43
1024
PE
(AUXFB data)
(R1A0-4)
(PCK)
DOR
1/N
PD
VCO
VVV
(111)
32-to-1
MUX
AUXFB
1
32
32
5
PFDOUT
VCO IN
VCORNG
Rrng
R1
R2
C
Vdd
Vss
13
Vdd
13
Vss
TESTMD
TESTCK
TESTGO
4
CR0-3
CR4-7
4
4
CL4-7
CL0-3
4
TESTRS
TESTEN
TESTAK
TESTRE
OS
OE
RE
RSTRH
SRCK
DO0-31
32
AUXFBWE

Functional Block Diagram

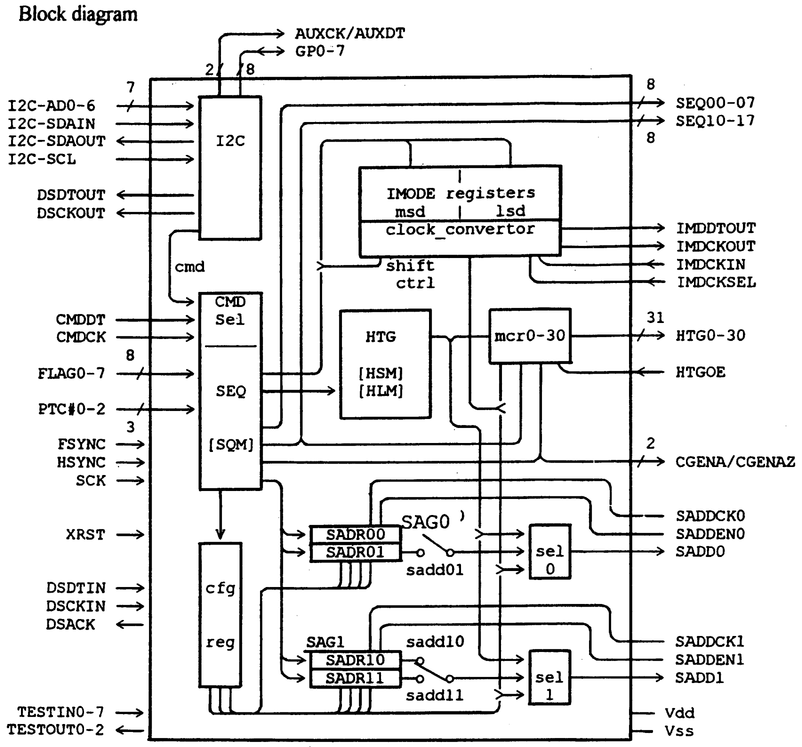
PLL2	0	0	0	0	1	1	1
PLL1	0	0	1	1	0	0	1
PLL0	0	1	0	1	0	1	0
N	8	7	6	5	4	3	2

■ TMS57106PCE 【TEXAS】
(Programmable Timing Controller)



121 HTG26
122 HTG27
123 Vdd
124 HTG28
125 HTG29
126 GND
127 HTG30
128 Vdd
129 CGENA
130 CGENAZ
131 GND
132 SEQ00
133 SEQ01
134 Vdd
135 SEQ02
136 SEQ03
137 GND
138 SEQ04
139 SEQ05
140 Vdd
141 SEQ06
142 SEQ07
143 GND
144 FLAG0
145 FLAG1
146 FLAG2
147 FLAG3
148 FLAG4
149 Vdd
150 FLAG5
151 FLAG6
152 FLAG7
153 CMDDT
154 CMDCK
155 GND
156 HSYNC
157 FSYNC
158 Vdd
159 XRST
160 GND
80 SADD1
79 GND
78 SADDEN1
77 SADDCK1
76 HTGOE
75 Vdd
74 IMDCKOUT
73 SADD0
72 GND
71 SADDEN0
70 SADDCK0
69 Vdd
68 IMDDTOUT
67 GND
66 IMDCKIN
65 IMDCKSEL
64 TESTIN7
63 Vdd
62 SEQ17
61 SEQ16
60 GND
59 SEQ15
58 SEQ14
57 Vdd
56 SEQ13
55 SEQ12
54 GND
53 SEQ11
52 SEQ10
51 Vdd
50 TESTOUT2
49 TESTOUT1
48 TESTIN6
47 TESTIN5
46 TESTIN4
45 GND
44 TESTIN3
43 TESTIN2
42 TESTIN1
41 TESTIN0

Block diagram



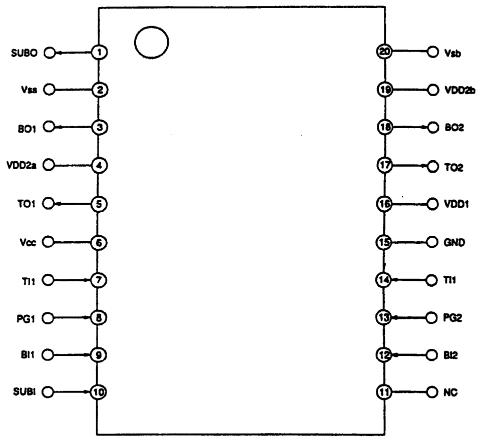
AUXCK/AUXDT
GP0-7
I2C-AD0-6
I2C-SDAIN
I2C-SDAOUT
I2C-SCL
I2C
DSDTOUT
DSCKOUT
IMODE registers
msd | lsd
clock_convertor
shift ctrl
cmd
CMDDT
CMDCK
CMD Sel
FLAG0-7
PTC#0-2
SEQ
FSYNC
HSYNC
SCK
[SQM]
HTG
[HSM]
[HLM]
mcr0-30
SEQ00-07
SEQ10-17
IMDDTOUT
IMDCKOUT
IMDCKIN
IMDCKSEL
HTG0-30
HTGOE
CGENA/CGENAZ
XRST
SAG0
SADR00
SADR01
sadd01
sel 0
SADDCK0
SADDEN0
SADD0
DSDTIN
DSCKIN
DSACK
cfg
reg
SAG1
SADR10
SADR11
sadd10
sadd11
sel 1
SADDCK1
SADDEN1
SADD1
TESTIN0-7
TESTOUT0-2
Vdd
Vss

* cfg reg (Config Register)
* mcr (Macro Block)

Program memory size:

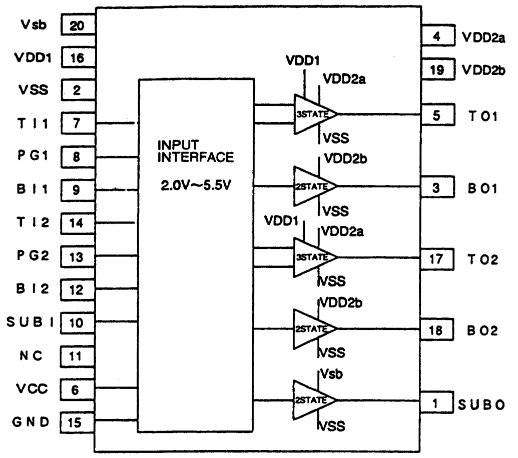
SQM(Sequence memory) = 2048 * 16 bits
HSM(HTG Sequence memory) = 4096 * 16 bits
HLM(HTG Loop memory) = 512 * 32 bits

■ UPD16510GR-X 【NEC】
(Level Shifter)



SUBO 1
Vss 2
BO1 3
VDD2a 4
TO1 5
Vcc 6
TI1 7
PG1 8
BI1 9
SUBI 10
20 Vsb
19 VDD2b
18 BO2
17 TO2
16 VDD1
15 GND
14 TI1
13 PG2
12 BI2
11 NC

TOP VIEW

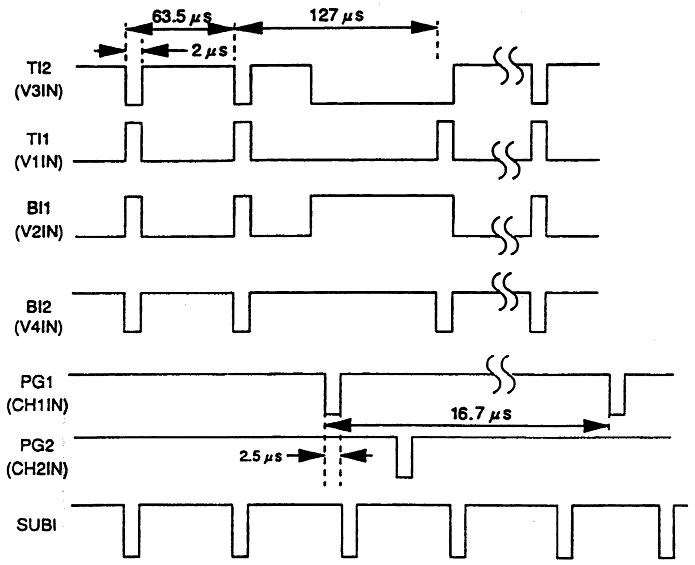


Vsb 20
VDD1 16
VSS 2
TI1 7
PG1 8
BI1 9
TI2 14
PG2 13
BI2 12
SUBI 10
NC 11
VCC 6
GND 15
INPUT INTERFACE
2.0V~5.5V
3STATE
VDD1
VDD2a
VDD2b
VSS
Vsb
4 VDD2a
19 VDD2b
5 TO1
3 BO1
17 TO2
18 BO2
1 SUBO

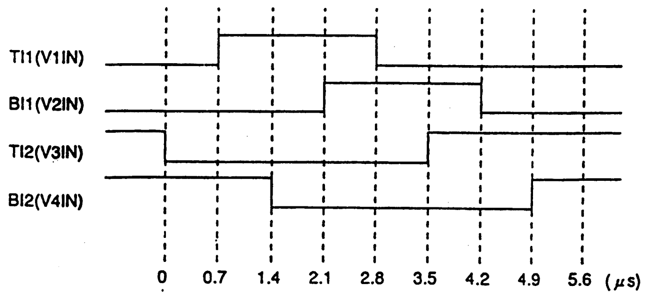
INPUT				OUTPUT		
TI1,2	PG	BI1,2	SUBI	TO1,2	BO1,2	SUBO
L	H	–	–	VMa	–	–
H	H	–	–	VL	–	–
L	L	–	–	VH	–	–
H	L	–	–	VL	–	–
–	–	L	–	–	VMb	–
–	–	H	–	–	VL	–
–	–	–	L			VL
–	–	–	H			VHH

(VL=VSS、VMa=VDD2a、VMb=VDD2b、VH=VDD1、VHH=Vsb)

INPUT PULSE TIMING CHART



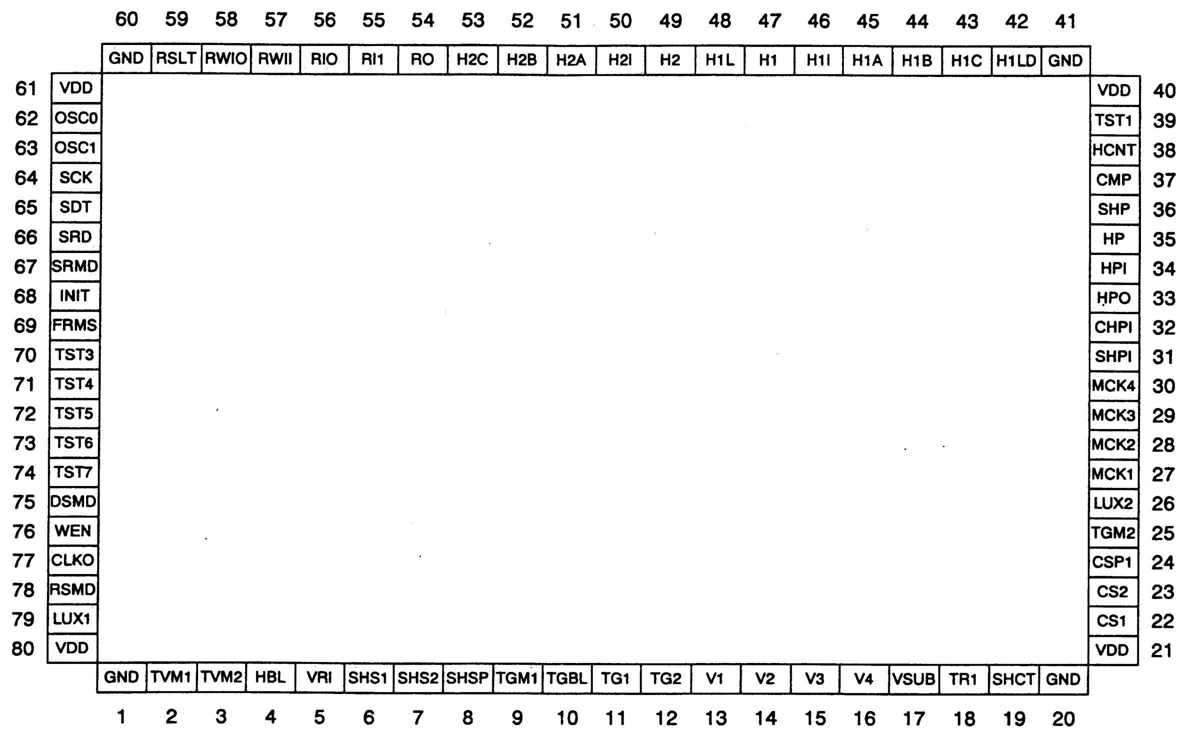
OVERLAP EXPANSION CHART



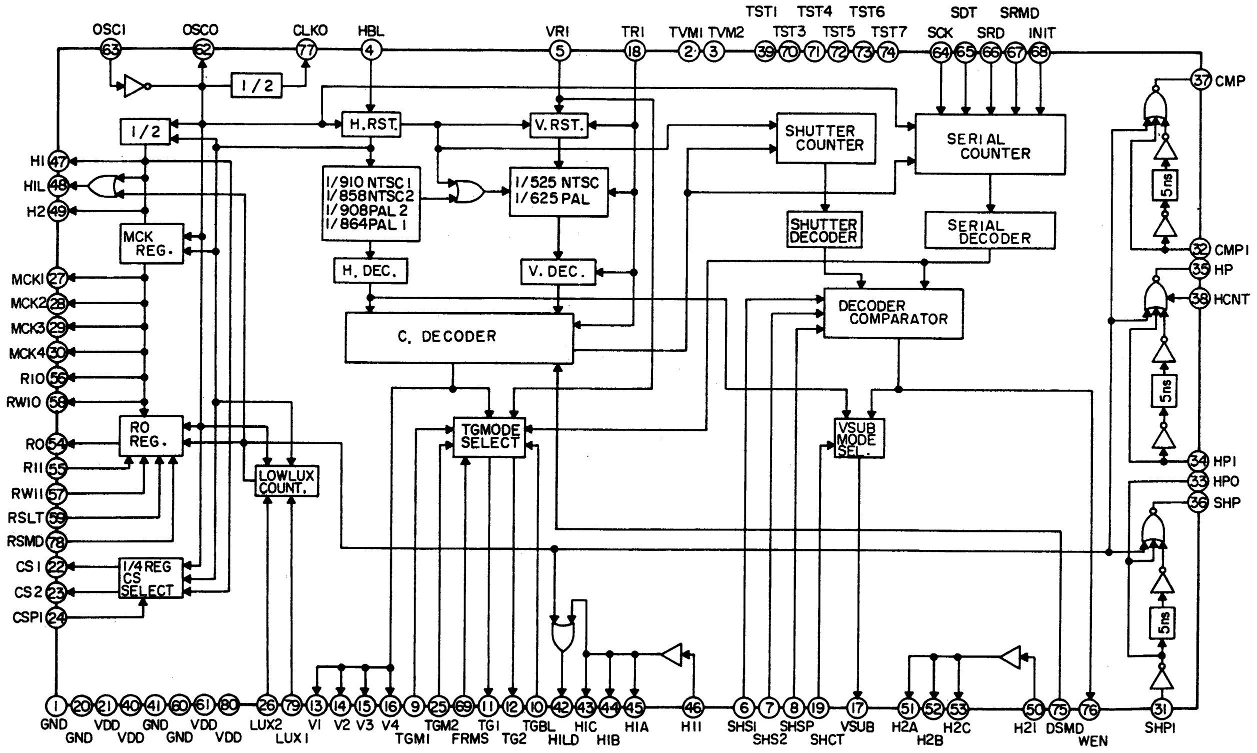
INPUT WAVE FORM

■ UPD9438BGK-BE9 【NEC】
(Timing Generator)

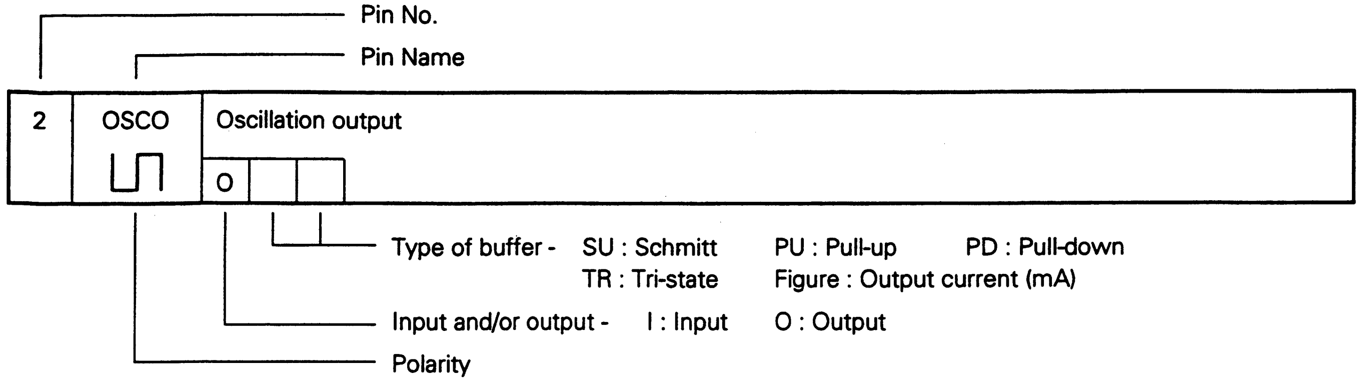
(Top View)


60 GND
59 RSLT
58 RWIO
57 RWII
56 RIO
55 RI1
54 RO
53 H2C
52 H2B
51 H2A
50 H2I
49 H2
48 H1L
47 H1
46 H1I
45 H1A
44 H1B
43 H1C
42 H1LD
41 GND
61 VDD
62 OSC0
63 OSC1
64 SCK
65 SDT
66 SRD
67 SRMD
68 INIT
69 FRMS
70 TST3
71 TST4
72 TST5
73 TST6
74 TST7
75 DSMD
76 WEN
77 CLKO
78 RSMD
79 LUX1
80 VDD
40 VDD
39 TST1
38 HCNT
37 CMP
36 SHP
35 HP
34 HPI
33 HPO
32 CHPI
31 SHPI
30 MCK4
29 MCK3
28 MCK2
27 MCK1
26 LUX2
25 TGM2
24 CSP1
23 CS2
22 CS1
21 VDD
1 GND
2 TVM1
3 TVM2
4 HBL
5 VRI
6 SHS1
7 SHS2
8 SHSP
9 TGM1
10 TGBL
11 TG1
12 TG2
13 V1
14 V2
15 V3
16 V4
17 VSUB
18 TR1
19 SHCT
20 GND

BLOCK DIAGRAM


OSCI
OSCO
CLKO
HBL
VRI
TRI
TVMI TVM2
TSTI TST4 TST6
TST3 TST5 TST7
SDT SRMD
SCK SRD INIT
1/2
1/2
H.RST.
V.RST.
SHUTTER COUNTER
SERIAL COUNTER
1/910 NTSC1
1/858NTSC2
1/908PAL 2
1/864PAL 1
1/525 NTSC
1/625 PAL
MCK REG.
SHUTTER DECODER
SERIAL DECODER
H. DEC.
V. DEC.
DECODER COMPARATOR
C. DECODER
RO REG.
TGMODE SELECT
VSUB MODE SEL.
LOWLUX COUNT.
1/4REG CS SELECT
5ns
5ns
5ns
CMP
CMPI
HP
HCNT
HPI
HPO
SHP
HI
HIL
H2
MCKI
MCK2
MCK3
MCK4
RIO
RWIO
RO
RII
RWII
RSLT
RSMD
CS1
CS2
CSPI
GND
VDD
GND
VDD
LUX2
VI
V2 V3 V4
TGM2
TGI
TGBL
HIC
HIA
HII
SHSI
SHSP
VSUB
H2A
H2C
H2I
DSMD
SHPI
GND
VDD
GND
VDD
LUXI
TGMI
FRMS
TG2
HILD
HIB
SHS2
SHCT
H2B
WEN

[Explanation of column]


Pin No.
Pin Name
2
OSCO
Oscillation output
O
Type of buffer - SU : Schmitt PU : Pull-up PD : Pull-down
TR : Tri-state Figure : Output current (mA)
Input and/or output - I : Input O : Output
Polarity

No.	Symbol	Description
1	GND	Grounding
2	TVM1	TV mode 1 I | PD
3	TVM2	TV mode 2 I | PD

	NTSC 1 1820 FH	NTSC 2 1716 FH	PAL 2 1816 FH	PAL 1 1728 FH
TVM1	L	H	L	H
TVM2	L	L	H	H

No.	Symbol	Description
4	HBL	Horizontal B lanking input (øHBLK) I | SH | PU • Horizontal SYNC. input terminal to be connected with IFHB of SYNC generator. The leading edge is detected.
5	VRI	EXT. vertical SYNC input I | SH | PU • Vertical SYNC. input terminal to be connected with IFVSA of sync generator. The leading edge is detected.
6	SHS1	Shutter speed 1 I | PD
7	SHS2	Shutter speed 2 I | PD
8	SHSP	Shutter speed setting I | PD

SHS2	SHS1	SHSP = L	FIELD SHSP = H	FRAME SHSP = H
L	L	1/60	1/60	1/30
L	H	1/100	1/30	1/15
H	L	1/2000	1/7.5	1/3.75
H	H	1/10000	1/3.75	1/1.875

Note: "FRAME" expresses storage time based on TG2 (pin 12) as the reference.

No.	Symbol	Description
9	TGM1	Storage Mode 1 I | PD • Input terminal for store mode setting. Use this terminal in combination with DSMD (pin 75) and TGM2 (pin 25). (Refer to the last page of this description of pin functions.)
10	TGBL	Transfer gate blanking I | PD • Slow shutter speed input for multi-speed shutter • Becomes active as blanking pulse at the rise of pulse.
11	TG1	Transfer gate pulse 1 O | 9 • Transfer gate drive pulse to transfer signal from photodiode to the vertical register (V1). (pin 13)
12	TG2	Transfer gate pulse 2 O | 9 • Transfer gate drive pulse to transfer signal from photodiode to the vertical register (V3). (pin 15)

No.	Symbol	Description
13	V1 ⊓⊔	V. transfer pulse 1 O 9 • Vertical transfer register drive pulse
14	V2 ⊓⊔	V. transfer pulse 2 O 9 • Vertical transfer register drive pulse
15	V3 ⊓⊔	V. transfer pulse 3 O 9 • Vertical transfer register drive pulse
16	V4 ⊓⊔	V. transfer pulse 4 O 9 • Vertical transfer register drive pulse
17	VSUB —	Board shutter pulse O 13 • Board shutter pulse to operate VOD shutter
18	TRI —	Random shutter function reset mode selection L: Sync reset mode H: Sync non-reset mode I PD
19	SHCT ⊓⊔	Shutter control I SH PD • Terminal to control shutter speed of multi-speed shutter. • When this terminal is used, set the serial shutter to 1/10000. • High level stops VSUB (pin 17) output.
20	GND	Grounding
21	VDD	+5 V power supply
22	CS1 _⊓_	Color sampling pulse 1 O 9 • Sampling pulse output for color separation sample holding
23	CS2 _⊓_	Color sampling pulse 2 O 9

CSP2	CSP1	CS1	CS2
L	L	MCK1	MCK1
L	H	MCK2	MCK2
H	L	MCK3	MCK3
H	H	MCK4	MCK4

No.	Symbol	Description
24	CSP1 —	Color sampling pulse phase setting 1 I PD • Phases of CS1 (pin 22) and CS2 (pin 23) are settable by this pulse.
25	TGM2 —	Store mode 2 I PD Input terminal for store mode setting. Use this terminal in combination with DSMD (pin 75) and TGM1 (pin 9). (Refer to the last page of this description of pin functions.)
26	LUX2 ⊓⊔	Low lux mode 2 I PU Low Lux setting terminal 2. L : Corresponding to CDS, H : Corresponding to RDS Refer to the usage example and Lolux mode tables.
27	MCK1 ⊓⊔	Main clock 1 O 9 • Main clock fck output terminal. • Output signal having the same phase as H1 (pin 47).
28	MCK2 ⊓⊔	Main clock 2 O 9 • Main clock fck output terminal. • Output signal whose phase is 90° delayed from H1 (pin 47).

No.	Symbol	Description
29	MCK3 ⊓⊔	Main clock 3 O 9 • Main clock fck output terminal. • Output signal whose phase is 180° delayed from H1 (No. 47).
30	MCK4 ⊓⊔	Main clock 4 O 9 • Main clock fck output terminal. • Output signal whose phase is 270° delayed from H1 (No. 47).
31	SHP1 ⊓⊔	Sample holding pulse input I SH • Input terminal to receive SHP (No. 36) output signal. • Input signal is equivalent to main clock.
32	CMPI ⊓⊔	Clamp pulse input I SH • Input terminal to receive SHP (No. 36) output signal. • Input signal is equivalent to main clock.
33	HPO _⊓_	Half pitch output O 9 • Output signal approx. 20 ns behind of SHP (No. 36) output. • To be connected with HP1 (No. 34) through capacitor and resistor.
34	HPI _⊓_	Half pitch input I SH • Input terminal for fine adjustment of HP (No. 35) output. • To be connected with HPO (No. 33) through capacitor and resistor.
35	HP _⊓_	HP Half pitch O 9 • Half pitch signal is used as a sampling one.
36	SHP _⊓_	Sample holding pulse O 9 • To sample video signal.
37	CMP _⊓_	Clamp pulse O 9 • To clamp video siganl.
38	HCNT —	Half pitch control I SH PD • To fix HP (No. 35) pulse at High level. L : Normal mode output H : High level fixing output
39	TST1 —	Test pin 1 I PD • Should be open in general.
40	VDD	+5 V power supply
41	GND	Grounding
42	H1LD ⊓⊔	H. final gate transfer pulse for 3-CCD O 9 • Horizontal drive pulse output that has High level in horizontal blanking period. • When set to the Lolux mode corresponding to RDS, the central part of drive signal output is taken off. (Refer to the Lolux mode table)
43	H1C ⊓⊔	H. transfer pulse for 3-CCD O 13 • Horizontal drive pulse output that has High level in horizontal blanking period
44	H1B ⊓⊔	H. transfer pulse for 3-CCD O 13 • Horizontal drive pulse output that has High level in horizontal blanking period
45	H1A ⊓⊔	H. transfer pulse for 3-CCD O 13 • Horizontal drive pulse output that has High level in horizontal blanking period

No.	Symbol	Description
46	H1I ⊓⊔	H. transfer pulse input for 3-CCD I • Input terminal to distribute signal to horizontal transfer pulse terminals for 3-CCD. • Connect with H1 (No. 47) for use of 3-CCD camera.
47	H1 ⊓⊔	H. transfer pulse O 13 • Horizontal drive signal output that has High level in horizontal blanking period. • Connect with H1I (No. 46) for use of 3-CCD camera.
48	H1L ⊓⊔	H. final gate transfer pulse O 9 • Horizontal drive signal output that has High level in horizontal blanking period. • When set to the Lolux mode corresponding to RDS, the central part of drive signal output is taken off. (Refer to the Lolux mode table)
49	H2 ⊓⊔	H. transfer pulse O 13 • Horizontal drive signal output that has Low level in horizontal blanking period. • Connect with H2I (No. 50) for use of 3-CCD camera.
50	H2I ⊓⊔	H. transfer pulse input for 3-CCD I • Input terminal to distribute signal to horizontal transfer pulse terminals for 3-CCD. • Connect with H2 (No. 49) for use of 3-CCD camera.
51	H2A ⊓⊔	H. transfer pulse for 3-CCD O 13 • Horizontal drive signal output that has Low level in horizontal blanking period.
52	H2B ⊓⊔	H. transfer pulse for 3-CCD O 13 • Horizontal drive signal output that has Low level in horizontal blanking period.
53	H2C ⊓⊔	H. transfer pulse for 3-CCD O 13 • Horizontal drive signal output that has Low level in horizontal blanking period.
54	RO _⊓_	H. output reset O 9 • CCD output reset pulse terminal. • This pulse is added with DC component and supplied to øR terminal of CCD.
55	RII ⊓⊔	H. output reset timing input I PU SH • Input terminal to adjust output timing of RO (No. 54) with external input. • Active when RSLT (No. 59) has High level. To be connected with RIO (No. 56).
56	RIO ⊓⊔	H. output reset timing output O 9 • Output terminal to adjust output timing of RO (No. 54) with external input. • To be connected with RII (No. 55).
57	RWII ⊓⊔	H. output reset pulse width setting input I PU SH • Input terminal to adjust pulse width of RO (No. 54) with external input. • Active when RSLT (No. 59) has High level. To be connected with RWIO (No. 58).
58	RWIO ⊓⊔	H. output reset pulse width setting output O 9 • Output terminal to adjust pulse width of RO (No. 54) with external input. • To be connected with RWII (No. 57).
59	RSLT —	H. output reset switching I PD • Input terminal to switch setting mode of RO (No. 54) output. L : Internal setting H : External setting
60	GND	Grounding
61	VDD	+5 V power supply
62	OSCO ⊓⊔	Oscillator output O • Output terminal of built-in oscillation circuit

No.	Symbol	Description
63	OSCI ⊔⊓	Oscillator input I • Input terminal of built-in oscillator circuit
64	SCK ⊓⊔	Serial clock I • Clock input terminal for serial interface. • Reads in at the pulse rise and inputs 1/4 frequency of original oscillation or lower.
65	SDT —	Serial data I • Data input terminal for serial interface. Input data is positive logic. • Sequential reading to start with LSB.
66	SRD —	Reception enable signal O 9 • Enable signal output terminal for serial interface to inform microprocessor whether it is enabled for data reception or disabled. L : Enabled for data reception H : Disabled for data reception
67	SRMD —	Reception mode switching I PD • L : Reception is possible only in V. blanking period. When reception does not finish in V. blanking period : Ineffective • H : Reception is always possible.
68	INIT —	Serial reset I • L : Disables serial interface from operation, or resets it forcibly (hard resetting). • H : Enables serial interface for original operation.
69	FRMS —	Frame select I PD 1-pixel or 2-pixel read-out field is selectable at a unit of frame. L : Ist and 2nd fields read-out H : 3rd and 4th fields read-out
70	TST3 —	Test pin 3 I PD • Should be open in general.
71	TST4 —	Test pin 4 I PD • Should be open in general.
72	TST5 —	Test pin 5 I PD • Should be open in general.
73	TST6 —	Test pin 6 I PD • Should be open in general.
74	TST7 —	Test pin 7 I PD • Should be open in general.
75	DSMD —	Device mode I PD • Switching terminal for 1/3-CCD or 2/3-CCD. L: Conforming to 1/3-CCD H: Conforming to 2/3-CCD
76	WEN ‾⊔‾	Write enable O 13 • Timing pulse output to write data in external memory at slow shutter speed. • At normal shutter speed, output signal is same with VD. • But it becomes 0.5H delayed signal in 2nd field.
77	CLKO ⊓⊔	Clock output O 13 • Half divided output of oscillation frequency
78	RSMD —	Switching of H. output reset pulse polarity O PD • To switch output polarity of RO (No. 54). L : Positive H : Negative
79	LUX 1 —	Low lux mode I PD • Low lux setting terminal L : Normal mode H: Lolux mode Refer to the low lux mode table.
80	VDD	+5 V power supply

- When CCD used and read-out method

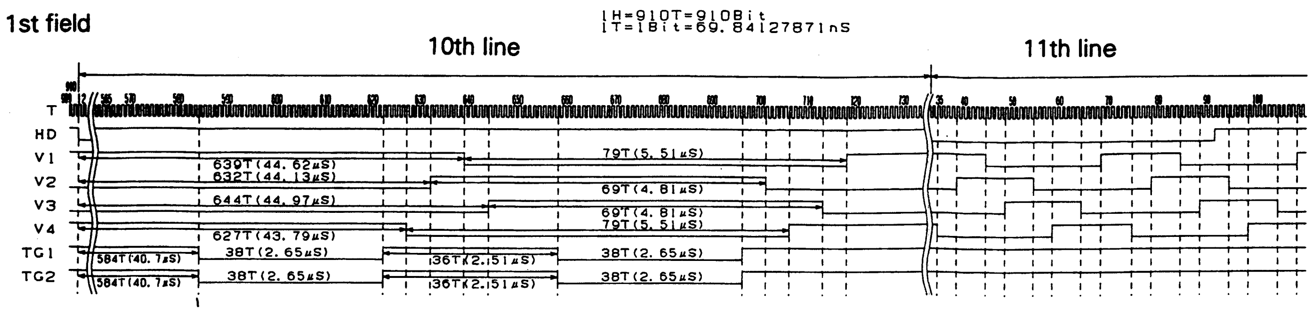
DSMD	TGM2	TGM1	When CCD used	Read-out method
L	L	L	1/3 CCD	Field
L	L	H	1/3 CCD	Frame
L	H	L	Inhabit	Inhabit
L	H	H	Inhabit	Inhabit
H	L	L	2/3 CCD	Field
H	L	H	2/3 CCD	Frame
H	H	L	2/3 CCD	2 pixels
H	H	H	2/3 CCD	1 pixel

- Lolux mode table

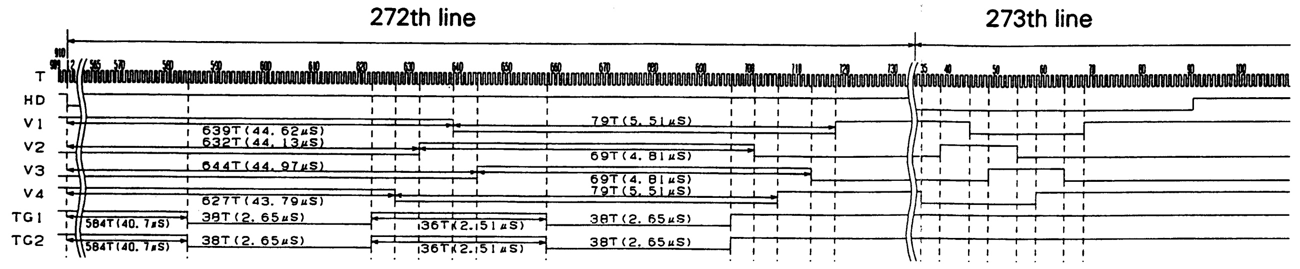
LUX2	LUX1	Mode
L	L	Normal
L	H	CDS
H	L	Normal
H	H	RDS

[NTSC] 2/3" CCD H-TIMING

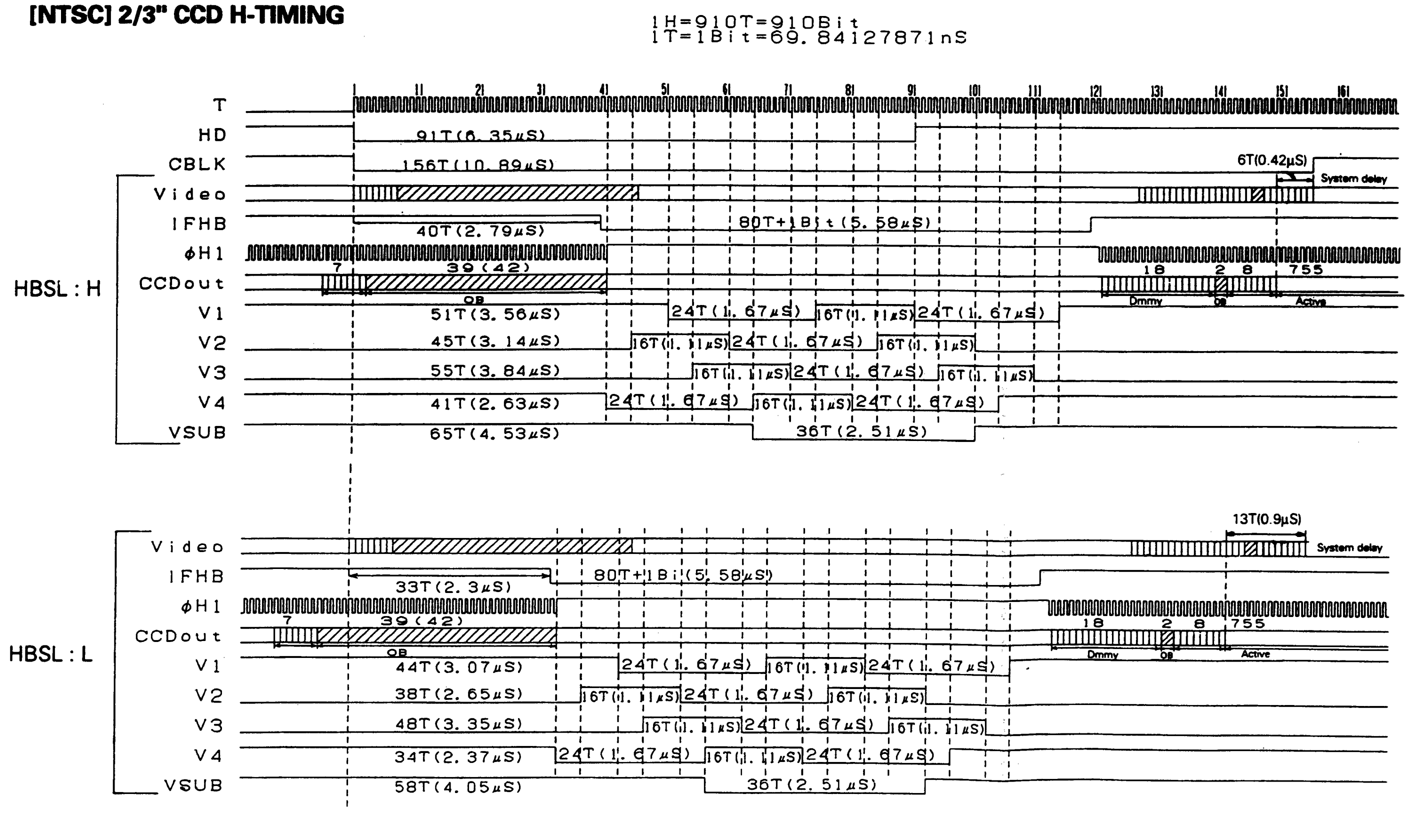
1st field


IH=910T=910Bit
IT=1Bit=69.8412787lnS
10th line
11th line
T
HD
V1
V2
V3
V4
TG1
TG2
639T(44.62μS)
632T(44.13μS)
644T(44.97μS)
627T(43.79μS)
38T(2.65μS)
584T(40.7μS)
36T(2.51μS)
79T(5.51μS)
69T(4.81μS)

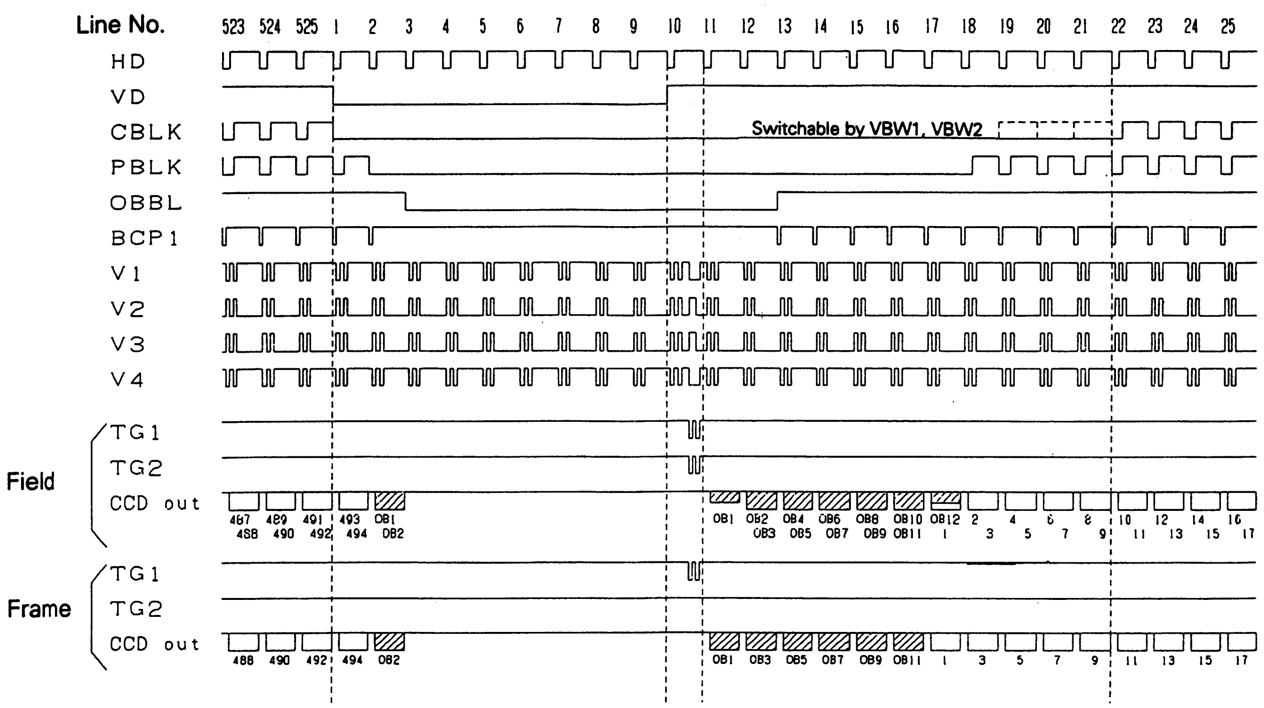
2nd field


272th line
273th line
T
HD
V1
V2
V3
V4
TG1
TG2
639T(44.62μS)
632T(44.13μS)
644T(44.97μS)
627T(43.79μS)
38T(2.65μS)
584T(40.7μS)
36T(2.51μS)
79T(5.51μS)
69T(4.81μS)

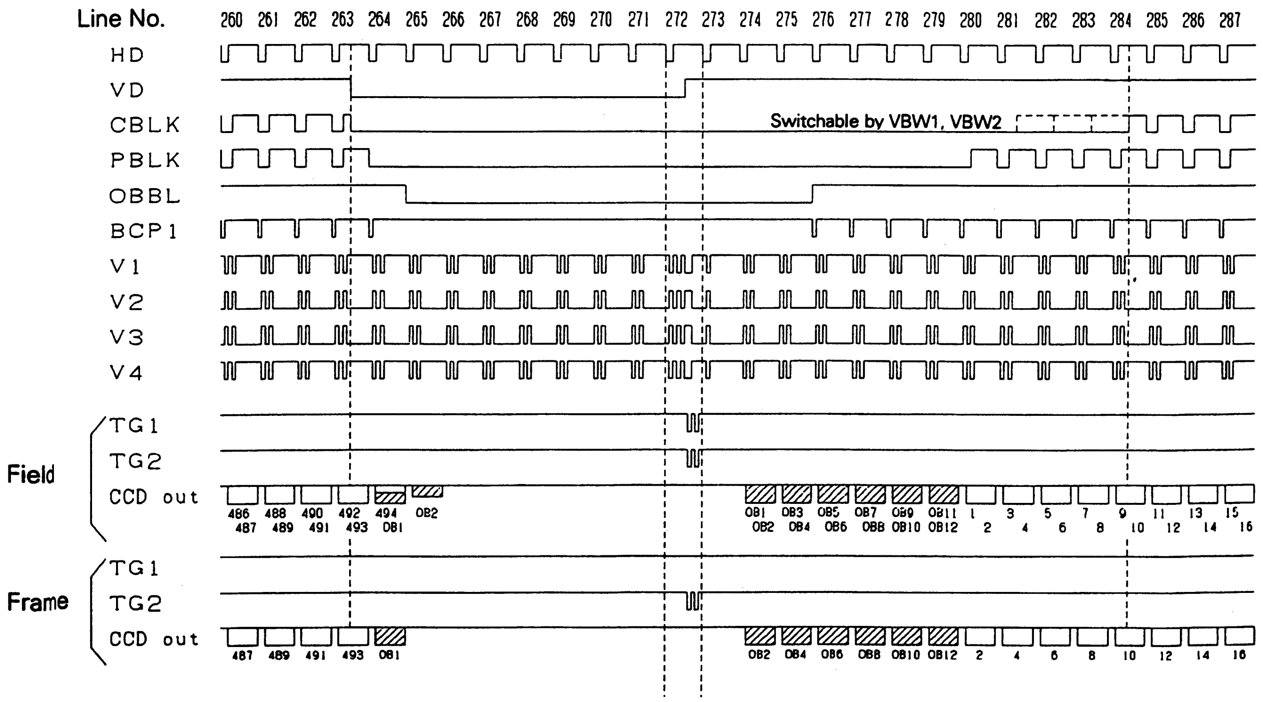
[NTSC] 2/3" CCD H-TIMING


IH=910T=910Bit
IT=1Bit=69.8412787lnS
T
HD
CBLK
Video
IFHB
φH1
CCDout
V1
V2
V3
V4
VSUB
HBSL : H
HBSL : L
91T(6.35μS)
156T(10.89μS)
6T(0.42μS)
System delay
40T(2.79μS)
80T+1Bit(5.58μS)
7
39(42)
OB
18
2
8
755
Dmmy
Active
51T(3.56μS)
45T(3.14μS)
55T(3.84μS)
41T(2.63μS)
65T(4.53μS)
24T(1.67μS)
16T(1.11μS)
36T(2.51μS)
13T(0.9μS)
33T(2.3μS)
44T(3.07μS)
38T(2.65μS)
48T(3.35μS)
34T(2.37μS)
58T(4.05μS)

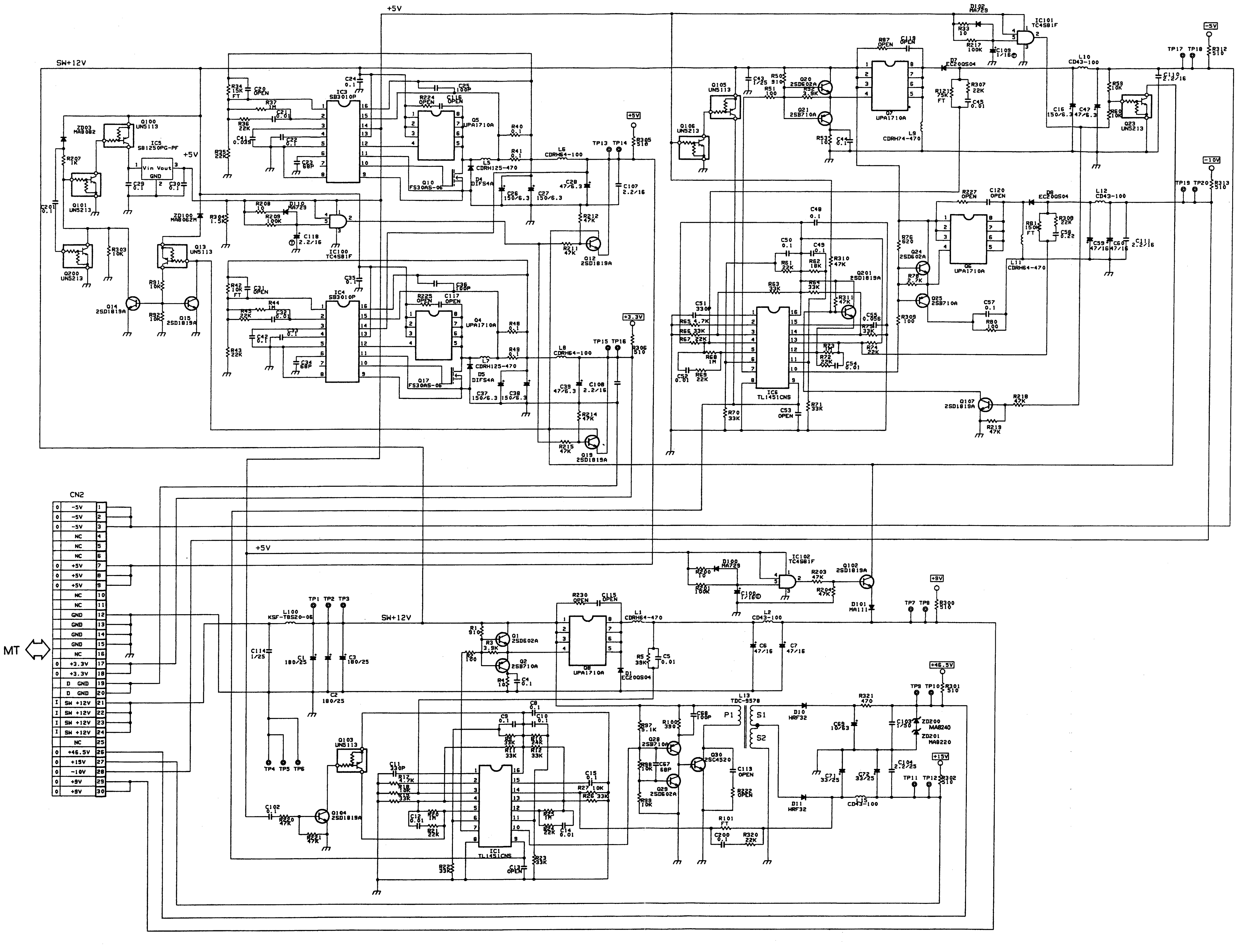
[NTSC] 2/3" CCD V-TIMING (1st field)


Line No.
523 524 525 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
HD
VD
CBLK
Switchable by VBW1, VBW2
PBLK
OBBL
BCP1
V1
V2
V3
V4
Field
TG1
TG2
CCD out
487 489 491 493 OB1
488 490 492 494 OB2
OB1 OB2 OB4 OB6 OB8 OB10 OB12 2 4 6 8 10 12 14 16
OB3 OB5 OB7 OB9 OB11 1 3 5 7 9 11 13 15 17
Frame
TG1
TG2
CCD out
488 490 492 494 OB2
OB1 OB3 OB5 OB7 OB9 OB11 1 3 5 7 9 11 13 15 17

[NTSC] 2/3" CCD V-TIMING (2nd field)


Line No.
260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287
HD
VD
CBLK
Switchable by VBW1, VBW2
PBLK
OBBL
BCP1
V1
V2
V3
V4
Field
TG1
TG2
CCD out
486 488 490 492 494 OB2
487 489 491 493 OB1
OB1 OB3 OB5 OB7 OB9 OB11 1 3 5 7 9 11 13 15
OB2 OB4 OB6 OB8 OB10 OB12 2 4 6 8 10 12 14 16
Frame
TG1
TG2
CCD out
487 489 491 493 OB1
OB2 OB4 OB6 OB8 OB10 OB12 2 4 6 8 10 12 14 16

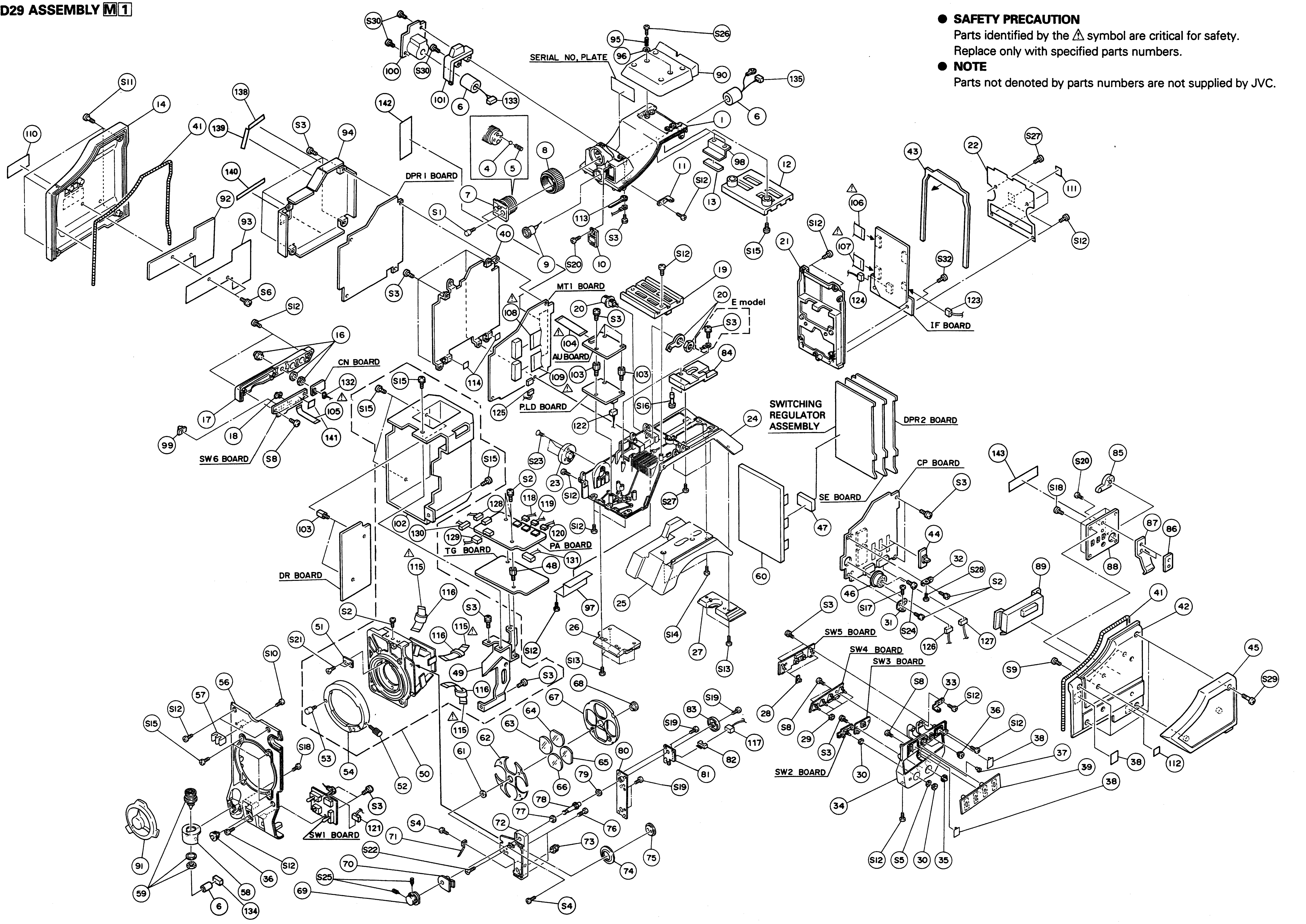
■ SCV2823-001
(Switching Regulator Assembly)


+5V
SW+12V
IC3 SB3010P
IC4 SB3010P
IC5 S81250PG-PF
IC100 TC4S81F
IC101 TC4S81F
IC102 TC4S81F
IC6 TL1451CNS
IC1 TL1451CNS
Q5 UPA1710A
Q4 UPA1710A
Q7 UPA1710A
Q6 UPA1710A
Q8 UPA1710A
Q10 FS30AS-06
Q17 FS30AS-06
Q12 2SD1819A
Q19 2SD1819A
Q14 2SD1819A
Q15 2SD1819A
Q100 UN5113
Q101 UN5213
Q200 UN5213
Q13 UN5113
Q105 UN5113
Q106 UN5213
Q23 UN5213
Q103 UN5113
Q20 2SD602A
Q21 2SB710A
Q24 2SD602A
Q25 2SB710A
Q201 2SD1819A
Q107 2SD1819A
Q102 2SD1819A
Q104 2SD1819A
Q1 2SD602A
Q2 2SB710A
Q28 2SB710A
Q29 2SD602A
Q30 2SC4520
L5 CDRH125-470
L7 CDRH125-470
L6 CDRH64-100
L8 CDRH64-100
L9 CDRH74-470
L10 CD43-100
L11 CDRH64-470
L12 CD43-100
L1 CDRH64-470
L2 CD43-100
L13 TDC-9578
L100 KSF-T8S20-06
D4 DIFS4A
D5 DIFS4A
D7 EC20QS04
D8 EC20QS04
D1 EC20QS04
D102 MA729
D110 MA729
D100 MA729
D101 MA111
D10 HRF32
D11 HRF32
ZD200 MA8240
ZD201 MA8220
ZD100 MA8062M
ZD03 MA8082
TP13 TP14
TP15 TP16
TP17 TP18
TP19 TP20
TP1 TP2 TP3
TP4 TP5 TP6
TP7 TP8
TP9 TP10
TP11 TP12
+5V
+3.3V
-5V
-10V
+9V
+46.5V
+15V
P1
S1
S2
MT
CN2
1 -5V
2 -5V
3 -5V
4 NC
5 NC
6 NC
7 +5V
8 +5V
9 +5V
10 NC
11 NC
12 GND
13 GND
14 GND
15 GND
16 NC
17 +3.3V
18 +3.3V
19 D GND
20 D GND
21 SW +12V
22 SW +12V
23 SW +12V
24 SW +12V
25 NC
26 +46.5V
27 +15V
28 -10V
29 +9V
30 +9V

SECTION 4
EXPLODED VIEW AND PARTS LIST

4.1 KY-D29 ASSEMBLY M1

- **SAFETY PRECAUTION**
  Parts identified by the ⚠ symbol are critical for safety.
  Replace only with specified parts numbers.
- **NOTE**
  Parts not denoted by parts numbers are not supplied by JVC.


SERIAL NO. PLATE
DPR1 BOARD
MT1 BOARD
E model
AU BOARD
PLD BOARD
CN BOARD
SW6 BOARD
SWITCHING REGULATOR ASSEMBLY
DPR2 BOARD
IF BOARD
CP BOARD
SE BOARD
TG BOARD
PA BOARD
DR BOARD
SW5 BOARD
SW4 BOARD
SW3 BOARD
SW2 BOARD
SW1 BOARD

4.2 KY-D29 ASSEMBLY LIST M1

M1MM☐☐☐☐

Symbol No.	Part No.	Part Name	Description
1	SC10203-002	TOP FRAME	
4	SC40465-045	STEEL BALL	
5	SC45107-001	SPRING	
6	SCV2631-001	FERRITE CORE	
7	SC31861-001	VF BASE	
8	SC45127-002	VF RING	
9	SCV0238-06S	CONNECTOR	VF
10	SC45128-001	FRONT COVER	
11	SC45120-011	BRACKET	
12	SC32051-001	TOP RAIL	
13	SC45834-005	SHEET	for TOP PLATE
14	SC10192-041	SIDE COVER(L)	
16	SCV1517-001	CONNECTOR	REMOTE
17	SC20639-011	CONNECTOR COVER	
18	SC44556-002	KNOB	DISP MIX
19	SC32051-002	BOTTOM RAIL	
20	SCV0749-011	BNC CONNECTOR	GENLOCK INPUT/MONITOR OUTPUT
21	SC10210-001	REAR FRAME	
22	SC45999-003	CONNECTOR PLATE	
23	SC40928-001	LOCK GEAR	
24	SC10146-004	BOTTOM FRAME	
25	SC10155-001	SHOULDER PAD	
26	SC20479-002	FRONT BASE	
27	SC31335-011	REAR BASE	
28	SC43403-001	KNOB	AUTO IRIS/BLACK
29	SC45264-001	RUBBER	
30	Refer to SW2 board assembly parts list	NUT/WASHER	Included in S1 on the SW2 board
31	SC45119-001	BRACKET (LOWER)	
32	SC45119-011	BRACKET (UPPER)	
33	SC45120-011	BRACKET (TO OPERATE COVER)	
34	SC20472-002	OPERATE COVER	
35	SC44828-002	SWITCH CAP	
36	SC44828-011	KNOB	LOLUX/FULL AUTO/VTR
37	SC43451-001	LED LENS	FULL AUTO
38	SC45995-001	LABEL	FILTER/BLACK/AUTO IRIS
39	SC31491-002	SWITCH PANEL	
40	SC32055-001	BRACKET(DPR1)	
41	SC44847-365	SHIELD TUBE	for LEFT SIDE COVER
42	SC10204-002	SIDE COVER(R)	
43	SC46062-001	CUSHION	
44	SC45244-011	SLIDE KNOB	DNR/SHUTTER/FILE
45	SC20640-003	CHEEK PAD	
46	SC45994-002	VR KNOB	AUDIO LEVEL
47	SC45834-004	SHEET	for SWITCHING REGULATOR ASSEMBLY
48	SC46081-005	STUD	
49	SC31486-002	BRACKET	for DR/TG/PA board
50	SCM0937-N0A	OPTICAL BLOCK ASSEMBLY	for U VERSION
50	SCM0937-P0A	OPTICAL BLOCK ASSEMBLY	for E VERSION
51	SC44628-002	LENS PLATE	
52	SC44704-002	KNOB	for MOUNT RING
53	SC40779-001	MOUNT SCREW	
54	SC31370-001	MOUNT RING	
56	SC10151-031	FRONT FRAME	
57	SC42550-011	CABLE HOLDER	
58	SC44538-001	CAP	
59	SCV1938-12S	LENS CONNECTOR	LENS
60	SC32103-001	SHIELD CASE	for SWITCHING REGULATOR ASSEMBLY
61	Q03093-841	PLASTIC WASHER	
62	SC45118-002	FILTER SHEET	
63	SC44651-001	FILTER	3200K
64	SC44652-001	FILTER	5600K
65	SC44653-021	FILTER	5600K + 6.3%ND
66	SC45117-001	FILTER	CROSS FILTER
67	SC31365-001	FILTER WHEEL	
68	SC44649-001	SHAFT	
69	SC31363-011	FILTER KNOB	
70	SC44647-001	GEAR HOLDER	
71	SC44627-001	FILTER SPRING	
72	SC31316-002	FILTER BASE	
73	SC44506-001	FILTER STOPPER	
74	SC44505-001	FILTER.I.GEAR	
75	SC44633-001	FILTER.I.SHAFT	
76	SC43397-003	SCREW	
77	SC44939-001	SPACER	
78	SC44508-012	FILTER SHAFT	
79	Q03093-819	PLASTIC WASHER	
80	SC31364-004	FILTER COVER	
81	SC83183-002	FP BOARD	
82	SCV1978-S05	CONNECTOR	Connect to FP board
83	SC44676-005	FILTER CAP ASSEMBLY	
84	SC31482-001	VTR BASE	
85	SC32059-001	CAP(R.SIDE)	
86	SC45993-001	PLATE(R)	
87	SC45992-001	SPRING(R)	
88	SC32058-003	NAME PLATE(R)	
89	SC32057-001	COVER(R.SIDE)	
90	SC20473-002	HANDLE BASE	
91	SC43825-002	CAP	
92	SC45998-001	HEAT BRACKET	
93	SC45679-001	SHEET	
94	SC32056-001	SHIELD COVER	
95	SC45195-001	SPRING	
96	Q03093-817	PLASTIC WASHER	
97	SC45276-001	COVER	for BOTTOM FRAME
98	SC46110-001	TOP PLATE	
99	SC45991-001	KNOB	MIC INPUT
100	SCV0316-03S	XLR CONNECTOR	MIC 3 PIN
101	SC32054-001	SPACER(MIC)	
102	SC32086-001	OPTICAL COVER	Provided for service parts only.
103	SC45260-008	STUD	Provided for service parts only.
⚠ 104	SCV2337-2010BD	FLAT CABLE	CN13 [AU] – CN13 [MT]
⚠ 105	SCV2337-1008BD	FLAT CABLE	CN12 [SW6] – CN12 [MT]
⚠ 106	PGW0203-060260	FLAT CABLE	CN34 [IF] – CN34 [MT]
⚠ 107	PGW0203-060200	FLAT CABLE	CN35 [IF] – CN35 [MT]
⚠ 108	PGW0203-130240	FLAT CABLE	CN28 [CP] – CN28 [MT]
⚠ 109	PGW0203-130200	FLAT CABLE	CN27 [CP] – CN27 [MT]
110	SC43658-001	CAUTION LABEL	for U VERSION
110	PU54392-1	LABEL	for E VERSION
111	SC41957-012	CAUTION LABEL	for U VERSION
112	SC43948-001	CAUTION LABEL	for U VERSION
113	SCV0518-009	WIRE CLAMP	for MIC CONNECTOR CABLE
114	SC45598-011	SHEET	for DPR1 BRACKET
⚠ 115	SCV2337-2407BD	FLAT CABLE	CN6, 7,8 [ISB/ISG/ISR] – CN6, 7, 8 [DR]
116	PGZ02360	FERRITE BEADS	
117	SC45989-010	WIRE ASSEMBLY	CN10 [TG] – Filter assembly
118	SC45988-003	WIRE ASSEMBLY	CN3 [ISB] – CN3 [PA]
119	SC45989-004	WIRE ASSEMBLY	CN4 [ISG] – CN4 [PA]
120	SC45988-005	WIRE ASSEMBLY	CN5 [ISR] – CN5 [PA]
121	SC45989-015	WIRE ASSEMBLY	CN15 [SW1] – CN15 [AU]

Symbol No.	Part No.	Part Name	Description
122	SC45989-025	WIRE ASSEMBLY	CN25 [PLD]-CN25 [DPR1]
123	SC45983-043	WIRE ASSEMBLY	CN43 [AU]-CN43 [IF]
124	SC45989-011	WIRE ASSEMBLY	CN11 [SW2]-CN11 [IF]
125	SC45989-017	WIRE ASSEMBLY	CN17 [SW2]-CN17 [MT]
126	SC45989-016	WIRE ASSEMBLY	CN16 [SW4]-CN16 [CP]
127	SC45989-018	WIRE ASSEMBLY	CN18 [SW5]-CN18 [CP]
128	SC45989-001	WIRE ASSEMBLY	CN1 [PA]-CN1 [DPR1]
129	MBY409MB14N	WIRE ASSEMBLY	CN21 [PA]-CN21 [TG]
130	MBY214MB12N	WIRE ASSEMBLY	CN36 [PA]-CN36 [MT]
131	MBY314MB13N	WIRE ASSEMBLY	CN19 [TG]-CN19 [MT]
132	SC45989-037	WIRE ASSEMBLY	CN37 [CN]-CN37 [MT]
133	SC45987-020	WIRE ASSEMBLY	for MIC 3 PIN CONNECTOR
134	MBY10-4-10Z	WIRE ASSEMBLY	for LENS CONNECTOR
135	SC45987-024	WIRE ASSEMBLY	for VF CONNECTOR
138	SCV2848-0030	SHIELD TAPE (30 mm)	
139	SCV2848-0040	SHIELD TAPE (40 mm)	
140	SCV2848-0080	SHIELD TAPE (80 mm)	
141	SC41702-013	SHEET	Behind CONNECTOR COVER
142	SC41702-012	SHEET	Behind MT board
143	SC45996-001	VR LOCATION LABEL	
S1	BYS4025M	BOLT	M4×25
S2	LPSP3004Z	SCREW	M3×4
S3	LPSP3006Z	SCREW	M3×6
S4	SPSK2030M	SCREW	M2×3
S5	Q03091-202	WASHER	
S6	SDSP2604M	SCREW	M2.6×4
S8	SDSF2606M	SCREW	M2.6×6
S9	SDSF3008M	SCREW	M3×8
S10	SDSF2005M	SCREW	M2×5
S11	SC43397-011	SCREW	
S12	SDSP3006M	SCREW	M3×6
S13	SDSP3008M	SCREW	M3×8
S14	SDSP4006M	SCREW	M4×6
S15	SDSP3005M	SCREW	M3×5
S16	SC43390-004	SCREW	
S17	SDSP2004M	SCREW	M2×4
S18	SPSK2025M	SCREW	M2×2.5
S19	SPSK2050M	SCREW	M2×5
S20	SPSK2640M	SCREW	M2.6×4
S21	SSSK2030M	SCREW	M2×3
S22	SSSK2050M	SCREW	M2×5
S23	SSSP3006M	SCREW	M3×6
S24	SPSK1460M	SCREW	M1.4×6
S25	YRS3004M	SCREW	M3×4
S26	SC43390-003	SCREW	
S27	SDSP2604M	SCREW	M2.6×4
S28	SDSP2006M	SCREW	M2×6
S29	SC43397-008	SCREW	
S30	SPSP2608N	SCREW	M2.6×8
S32	SDSP2606M	SCREW	M2.6×6

SECTION 5
ELECTRICAL PARTS LIST

SAFETY PRECAUTION:
Parts identified by the ⚠ symbol are critical for safety. Replace only with specified parts numbers.
For maximum reliability and performance, all other replacement parts should be identical to those specified.

NOTE:

- Parts not denoted by parts numbers are not supplied by JVC.
- The electrical parts numbers listed on the manual are organized by new JVC standard parts system. The new parts numbers are different from previous numbers, even if the components are same.
- Abbreviations in this list are as follows:

RESISTORS

In the "Description" column:
All resistance values are in ohms (Ω).
K expresses kilo-ohm (1,000 ohms, kΩ).
M expresses mega-ohm (10^6 ohms, MΩ).

In the "Parts Name" column:
COMP. RESISTOR : Composition Resistor
U.F. RESISTOR : Non-inflammable Resistor
O.M.F. RESISTOR : Oxide Metalized Film Resistor
FUSI. RESISTOR : Fusible Resistor
M.P. RESISTOR : Metal Plate Resistor
M.G. RESISTOR : Metal Graze Resistor
M.F. RESISTOR : Metal Film Resistor
W.W. RESISTOR : Wire Wound Resistor

CAPACITORS

In the "Description" column:
All capacitance values are in microfarad (μF) unless otherwise indicated.
P expresses picofarad (10^{-12} farad, pF).

In the "Parts Name" column:
TRIM. CAPACITOR : Trimmer Capacitor
CER. CAPACITOR : Ceramic Capacitor
E. CAPACITOR : Electrolytic Capacitor
TAN. CAPACITOR : Tantalum Capacitor
MPP CAPACITOR : Metalized Polypropylene Capacitor
O.F. CAPACITOR : Oil Film Capacitor
MPF CAPACITOR : Metalized Polyfilm Capacitor
F.M. CAPACITOR : Film Mica Capacitor
P.P. CAPACITOR : Polypropylene Capacitor
P.S. CAPACITOR : Polystyrene Capacitor

Note: In the "Description" column of the parts list, (U) means the parts for the U version while (E) is for the E Version.

Symbol No.	Part No.	Part Name	Description	
IC1	SCV1585-064	I.C.(M)	JVC (U)	← **for U version**
	SCV1585-067	I.C.(M)	JVC (E)	← **for E version**

5.1 MT BOARD ASSEMBLY LIST 0 1

SCK2478-00A 0 1 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
IC2	ADC0838CCWM-X	I.C.(M)	NATIONAL SEMICO
IC4	TC74HC165AF-X	I.C.(M)	TOSHIBA
IC5	TC74HC4094AF-X	I.C.(M)	TOSHIBA
IC6	TC74HC4094AF-X	I.C.(M)	TOSHIBA
IC9	TC4W53F-X	I.C.(M)	TOSHIBA
IC10	TC4W53F-X	I.C.(M)	TOSHIBA
IC11	NJM062M-X	I.C.(M)	JRC
Q3	DTA124EUA-X	TRANSISTOR	ROHM
Q4	DTA124EUA-X	TRANSISTOR	ROHM
Q5	DTC124EUA-X	TRANSISTOR	ROHM
Q6	DTA124EUA-X	TRANSISTOR	ROHM
Q7	DTA124EUA-X	TRANSISTOR	ROHM
Q8	DTA124EUA-X	TRANSISTOR	ROHM
Q9	2SJ364/QR/-X	FET	MATSUSHITA
Q10	2SK663/QR/-X	FET	MATSUSHITA
Q11	MSC3930/B/-X	TRANSISTOR	MOTOROLA
D1	HZU3CLL-X	ZENER DIODE	HITACHI
D2	HZU3CLL-X	ZENER DIODE	HITACHI
D3	MA143A-X	DIODE	MATSUSHITA
D4	MA143A-X	DIODE	MATSUSHITA
D5	MA143A-X	DIODE	MATSUSHITA
D7	MA142WK-X	DIODE	MATSUSHITA
D8	MA143A-X	DIODE	MATSUSHITA
D9	MA143A-X	DIODE	MATSUSHITA
D17	MA143A-X	DIODE	MATSUSHITA
D18	MA143A-X	DIODE	MATSUSHITA
D23	MA143A-X	DIODE	MATSUSHITA
D26	MA143A-X	DIODE	MATSUSHITA
D27	MA143A-X	DIODE	MATSUSHITA
D28	MA143A-X	DIODE	MATSUSHITA
D29	MA143A-X	DIODE	MATSUSHITA
R1	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R2	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R3	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R4	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R5	NRSA63J-392X	M.G.RESISTOR	3.9k 1/16W
R6	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R7	NRSA63J-622X	M.G.RESISTOR	6.2k 1/16W
R22	NRSA63J-106X	M.G.RESISTOR	10M 1/16W
R23	NRSA63J-106X	M.G.RESISTOR	10M 1/16W
R24	NRSA63J-102X	M.G.RESISTOR	1k 1/16W
R25	NRSA63J-332X	M.G.RESISTOR	3.3k 1/16W
R31	NRSA63J-272X	M.G.RESISTOR	2.7k 1/16W
R32	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R33	NRSA63J-334X	M.G.RESISTOR	330k 1/16W
R34	NRSA63J-104X	M.G.RESISTOR	100k 1/16W
R35	NRSA63J-124X	M.G.RESISTOR	120k 1/16W
R36	NRSA63J-102X	M.G.RESISTOR	1k 1/16W
R37	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R38	NRSA63J-472X	M.G.RESISTOR	4.7k 1/16W
R39	NRSA63J-220X	M.G.RESISTOR	22 1/16W
R48	NRSA63J-101X	M.G.RESISTOR	100 1/16W
R49	NRSA63J-101X	M.G.RESISTOR	100 1/16W
R50	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R51	NRSA63J-183X	M.G.RESISTOR	18k 1/16W
R52	NRSA63J-101X	M.G.RESISTOR	100 1/16W

Symbol No.	Part No.	Part Name	Description
R57	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R58	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R59	NRSA63J-823X	M.G.RESISTOR	82k 1/16W
R60	NRSA63J-273X	M.G.RESISTOR	27k 1/16W
R61	NRSA63J-392X	M.G.RESISTOR	3.9k 1/16W
R62	NRSA63J-622X	M.G.RESISTOR	6.2k 1/16W
R63	NRSA63J-750X	M.G.RESISTOR	75 1/16W
R64	NRSA63J-104X	M.G.RESISTOR	100k 1/16W
R65	NRSA63J-681X	M.G.RESISTOR	680 1/16W
R71	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R72	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R73	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R74	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R75	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R76	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R77	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R78	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R79	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R80	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
C1	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C2	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C3	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C15	NBE21AM-106X	TAN.CAPACITOR	10 10V
C16	NBE21AM-106X	TAN.CAPACITOR	10 10V
C19	NEH91CM-106X	E.CAPACITOR	10 16V
C20	NBE21CM-475X	TAN.CAPACITOR	4.7 16V
C26	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C27	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C30	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C33	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C37	NCB31CK-473X	CER.CAPACITOR	0.047 16V
CN2	SCV0500-001	CONNECTOR	30PIN
CN12	SCV2644-110W	CONNECTOR	10PIN
CN13	SCV2644-120X	CONNECTOR	20PIN
CN17	SSV1591-L05	CONNECTOR	5PIN
CN19	SCV1770-013	CONNECTOR	13PIN
CN22	SCV2808-050	CONNECTOR	50PIN
CN23	SCV2808-050	CONNECTOR	50PIN
CN24	SCV1770-007	CONNECTOR	7PIN
CN26	SCV1770-004	CONNECTOR	4PIN
CN27	PGZ01938-020Z	CONNECTOR	20PIN
CN28	PGZ01938-024Z	CONNECTOR	24PIN
CN29	SCV0500-001	CONNECTOR	30PIN
CN30	SCV0500-001	CONNECTOR	30PIN
CN31	SCV0500-001	CONNECTOR	30PIN
CN32	SCV0500-001	CONNECTOR	30PIN
CN34	SCV2644-126X	CONNECTOR	26PIN
CN35	SCV2644-120X	CONNECTOR	20PIN
CN36	SCV1770-012	CONNECTOR	12PIN
CN37	SCV1770-005	CONNECTOR	5PIN
CN44	SCV1770-003	CONNECTOR	3PIN
K4	SCV2662-027	FERRITE BEADS	
K6	SCV2662-027	FERRITE BEADS	
K7	SCV2662-027	FERRITE BEADS	
SWR1	SCV2823-002	SW. REG ASSEMBLY	

5.2 TG BOARD ASSEMBLY LIST 0 2
SCK2477-01-N0A
SCK2477-01-P0A

0 2 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description	
IC1	JCS0028	I.C.(M)	JVC	
IC2	UPD9438BGK-BE9	I.C.(M)	NEC	
IC3	TC74HC04AF-X	I.C.(M)	TOSHIBA	
IC4	TC7SU04F-X	I.C.(M)	TOSHIBA	
IC5	TC7SU04F-X	I.C.(M)	TOSHIBA	
IC6	TC74VHC08FS-X	I.C.(M)	TOSHIBA	
IC7	TC7SH08FU-X	I.C.(M)	TOSHIBA	
IC8	TC7SH32FU-X	I.C.(M)	TOSHIBA	
IC9	TC7SH32FU-X	I.C.(M)	TOSHIBA	
IC10	TC7SH86FU-X	I.C.(M)	TOSHIBA	
IC11	TC7SH32FU-X	I.C.(M)	TOSHIBA	
IC12	TC7S04F-X	I.C.(M)	TOSHIBA	
IC13	TC7SH32FU-X	I.C.(M)	TOSHIBA	
IC14	TC7S02F-X	I.C.(M)	TOSHIBA	
D1	MA335-X	DIODE	MATSUSHITA	
D2	MA335-X	DIODE	MATSUSHITA	
R1	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R2	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R4	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R5	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R6	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R7	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R8	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R9	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R10	NRSA63J-562X	M.G.RESISTOR	5.6k	1/16W
R11	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R12	NRSA63J-183X	M.G.RESISTOR	18k	1/16W
R13	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R14	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R16	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R17	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R18	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W(E)
R19	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R20	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R21	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R24	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R26	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
R27	NRSA63J-271X	M.G.RESISTOR	270	1/16W
R28	NRSA63J-221X	M.G.RESISTOR	220	1/16W
R29	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R30	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R31	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R32	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R33	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R34	NRSA63J-220X	M.G.REGISTOR	22	1/16W
R35	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R36	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R37	NRSA63J-220X	M.G.RESISTOR	22	1/16W
R38	NRSA63J-330X	M.G.RESISTOR	33	1/16W
R39	NRSA63J-330X	M.G.RESISTOR	33	1/16W
R40	NRSA63J-330X	M.G.RESISTOR	33	1/16W
R41	NRSA63J-331X	M.G.RESISTOR	330	1/16W
R42	NRSA63J-101X	M.G.RESISTOR	100	1/16W
R43	NRSA63J-561X	M.G.RESISTOR	560	1/16W
R44	NRSA63J-181X	M.G.RESISTOR	180	1/16W
R45	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W(E)

Symbol No.	Part No.	Part Name	Description	
R46	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R47	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R48	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R49	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R51	NRSA63J-471X	M.G.RESISTOR	470	1/16W
R53	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R54	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R55	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R56	NRSA63J-151X	M.G.RESISTOR	150	1/16W
R58	NRSA63J-392X	M.G.RESISTOR	3.9k	1/16W
R59	NRSA63J-392X	M.G.RESISTOR	3.9k	1/16W
R60	NRSA63J-392X	M.G.RESISTOR	3.9k	1/16W
VR8	NVP1416-203X	TRIM.RESISTOR	Eoo	20k
C1	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C2	NEH90JM-336X	E.CAPACITOR	33	6.3V
C3	NEH90JM-336X	E.CAPACITOR	33	6.3V
C4	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C5	NEA60JM-337X	E.CAPACITOR	330	6.3V
C6	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C7	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C8	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C9	NDC31HJ-270X	CER.CAPACITOR	27p	50V
C10	NDC31HJ-270X	CER.CAPACITOR	27p	50V
C11	NDC31HJ-270X	CER.CAPACITOR	27p	50V
C12	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C13	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C15	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C16	NDC31HJ-121X	CER.CAPACITOR	120p	50V
C17	NDC31HJ-121X	CER.CAPACITOR	120p	50V
C18	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C19	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C20	NBE21EM-105X	TAN.CAPACITOR	1	25V
C21	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C22	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C23	NDC31HJ-270X	CER.CAPACITOR	27p	50V
C24	NDC31HJ-270X	CER.CAPACITOR	27p	50V
C25	NBE21EM-105X	TAN.CAPACITOR	1	25V
C26	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C27	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C30	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C31	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C32	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C33	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C34	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C35	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C36	NCB31CK-473X	CER.CAPACITOR	0.047	16V
L1	NQL124K-150X	COIL	15μH	
L2	NQL124K-150X	COIL	15μH	
X1	CE41081-A0A	CRYSTAL	28.636MHz	(U)
	CE41212-001	CRYSTAL	28.375MHz	(E)
CN9	SCV1814-026X	CONNECTOR	26PIN	

[TG]

Symbol No.	Part No.	Part Name	Description
CN10	SCV1770-005	CONNECTOR	5PIN
CN19	SCV1770-013	CONNECTOR	13PIN
CN21	SCV1770-014	CONNECTOR	14PIN
CN33	SSV2416-103Z	CONNECTOR	3PIN
TP1	SCV1880-001	TEST POINT	
K1 – K16	SCV2662-027	FERRITE BEADS	

5.3 DR BOARD ASSEMBLY LIST 03

SCK2477-02-00A

03☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
IC1	TC74HC04AF-X	I.C.(M)	TOSHIBA
IC101	UPD16510GR-X	I.C.(M)	NEC
IC102	UPD16510GR-X	I.C.(M)	NEC
IC201	UPD16510GR-X	I.C.(M)	NEC
IC202	UPD16510GR-X	I.C.(M)	NEC
IC301	UPD16510GR-X	I.C.(M)	NEC
IC302	UPD16510GR-X	I.C.(M)	NEC
Q1	2SD1820/QR/-X	TRANSISTOR	MATSUSHITA
Q2	2SD1820/QR/-X	TRANSISTOR	MATSUSHITA
Q3	2SD1820/QR/-X	TRANSISTOR	MATSUSHITA
Q4	2SB1219/QR/-X	TRANSISTOR	MATSUSHITA
Q5	2SB1219/QR/-X	TRANSISTOR	MATSUSHITA
Q101	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q102	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q103	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q104	2SA1462/3-4/-X	TRANSISTOR	NEC
Q105	2SC3735/4-5/-X	TRANSISTOR	NEC
Q201	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q202	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q203	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q204	2SA1462/3-4/-X	TRANSISTOR	NEC
Q205	2SC3735/4-5/-X	TRANSISTOR	NEC
Q301	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q302	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q303	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q304	2SA1462/3-4/-X	TRANSISTOR	NEC
Q305	2SC3735/4-5/-X	TRANSISTOR	NEC
D1	MA142WA-X	DIODE	MATSUSHITA
D2	MA142A-X	DIODE	MATSUSHITA
D5	MA142WA-X	DIODE	MATSUSHITA
D101	MA142WA-X	DIODE	MATSUSHITA
D102	MA742-X	DIODE	MATSUSHITA
D103	MA742-X	DIODE	MATSUSHITA
D104	MA142A-X	DIODE	MATSUSHITA
D105	MA143A-X	DIODE	MATSUSHITA
D201	MA142WA-X	DIODE	MATSUSHITA
D202	MA742-X	DIODE	MATSUSHITA
D203	MA742-X	DIODE	MATSUSHITA
D204	MA142WA-X	DIODE	MATSUSHITA
D205	MA143A-X	DIODE	MATSUSHITA
D301	MA142WA-X	DIODE	MATSUSHITA
D302	MA742-X	DIODE	MATSUSHITA
D303	MA742-X	DIODE	MATSUSHITA
D305	MA143A-X	DIODE	MATSUSHITA
R1	NRSA63J-822X	M.G.RESISTOR	8.2k 1/16W
R2	NRSA63J-123X	M.G.RESISTOR	12k 1/16W
R3	NRSA63J-100X	M.G.RESISTOR	10 1/16W
R4	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R5	NRSA63J-222X	M.G.RESISTOR	2.2k 1/16W
R6	NRSA63J-153X	M.G.RESISTOR	15k 1/16W
R7	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R8	NRSA63J-822X	M.G.RESISTOR	8.2k 1/16W
R9	NRSA63J-123X	M.G.RESISTOR	12k 1/16W
R10	NRSA63J-103X	M.G.RESISTOR	10k 1/16W
R11	NRSA63J-393X	M.G.RESISTOR	39k 1/16W
R12	NRSA63J-333X	M.G.RESISTOR	33k 1/16W

Symbol No.	Part No.	Part Name	Description	
R13	NRSA63J-563X	M.G.RESISTOR	56k	1/16W
R14	NRSA63J-333X	M.G.RESISTOR	33k	1/16W
R15	NRSA63J-472X	M.G.RESISTOR	4.7k	1/16W
R16	NRSA63J-183X	M.G.RESISTOR	18k	1/16W
R17	NRSA63J-221X	M.G.RESISTOR	220	1/16W
R18	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R19	NRSA63J-4R7X	M.G.RESISTOR	4.7	1/16W
R20	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R21	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R22	NRSA63J-220X	M.G.RESISTOR	22	1/16W
R23	NRSA63J-220X	M.G.RESISTOR	22	1/16W
R24	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R25	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R26	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R28	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R30	NRSA63J-220X	M.G.RESISTOR	22	1/16W
R104	NRSA63J-823X	M.G.RESISTOR	82k	1/16W
R105	NRSA63J-472X	M.G.RESISTOR	4.7k	1/16W
R106	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R107	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R108	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
R109	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R110	NRSA63J-100X	M.G.RESISTOR	10	1/16W
R111	NRSA63J-100X	M.G.RESISTOR	10	1/16W
R112	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R204	NRSA63J-823X	M.G.RESISTOR	82k	1/16W
R205	NRSA63J-472X	M.G.RESISTOR	4.7k	1/16W
R206	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R207	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R208	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
R209	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R210	NRSA63J-100X	M.G.RESISTOR	10	1/16W
R211	NRSA63J-100X	M.G.RESISTOR	10	1/16W
R212	NRSA63J-822X	M.G.RESISTOR	8.2k	1/16W
R213	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R214	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R215	NRSA63J-104X	M.G.RESISTOR	100k	1/16W
R304	NRSA63J-823X	M.G.RESISTOR	82k	1/16W
R305	NRSA63J-472X	M.G.RESISTOR	4.7k	1/16W
R306	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R307	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R308	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
R309	NRSA63J-103X	M.G.RESISTOR	10k	1/16W
R310	NRSA63J-100X	M.G.RESISTOR	10	1/16W
R311	NRSA63J-100X	M.G.RESISTOR	10	1/16W
C1	NBE21CM-225X	TAN.CAPACITOR	2.2	16V
C2	NEH90JM-107X	E.CAPACITOR	100	6.3V
C3	NEH90JM-107X	E.CAPACITOR	100	6.3V
C4	NEA60JM-337X	E.CAPACITOR	330	6.3V
C5	NEA60JM-337X	E.CAPACITOR	330	6.3V
C6	NEH91CM-106X	E.CAPACITOR	10	16V
C7	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C8	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C9	NBE21CM-225X	TAN.CAPACITOR	2.2	16V
C10	NBE40GM-476X	TAN.CAPACITOR	47	
C11	NEH91CM-106X	E.CAPACITOR	10	16V
C12	NBE21EM-105X	TAN.CAPACITOR	1	25V
C13	NEH91CM-476X	E.CAPACITOR	47	16V

Symbol No.	Part No.	Part Name	Description	
C14	NEA61AM-227X	E.CAPACITOR	220	10V
C15	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C18	NEH90JM-336X	E.CAPACITOR	33	6.3V
C20	NCB11CK-105X	CER.CAPACITOR	1	16V
C21	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C22	NBE20JM-106X	TAN.CAPACITOR	10	6.3V
C23	NBE21CM-225X	TAN.CAPACITOR	2.2	16V
C24	NBE41CM-156X	TAN.CAPACITOR	15	16V
C101	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C102	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C103	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C104	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C105	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C106	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C107	NEH91HM-105X	E.CAPACITOR	1	50V
C108	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C109	NDC31HJ-5R0X	CER.CAPACITOR	5p	50V
C110	NDC31HJ-5R0X	CER.CAPACITOR	5p	50V
C111	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C113	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C201	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C202	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C203	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C204	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C205	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C206	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C207	NEH91HM-105X	E.CAPACITOR	1	50V
C208	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C209	NDC31HJ-5R0X	CER.CAPACITOR	5p	50V
C210	NDC31HJ-5R0X	CER.CAPACITOR	5p	50V
C211	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C212	NBE21EM-105X	TAN.CAPACITOR	1	25V
C213	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C301	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C302	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C303	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C304	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C305	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C306	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C307	NEH91HM-105X	E.CAPACITOR	1	50V
C308	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C309	NDC31HJ-5R0X	CER.CAPACITOR	5p	50V
C310	NDC31HJ-5R0X	CER.CAPACITOR	5p	50V
C311	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C312	NEH61EM-106X	E.CAPACITOR	10	25V
C313	NCB31EK-103X	CER.CAPACITOR	0.01	25V
C314	NEH91CM-106X	E.CAPACITOR	10	16V
CN6	SCV2644-124X	CONNECTOR	24PIN	
CN7	SCV2644-124X	CONNECTOR	24PIN	
CN8	SCV2644-124X	CONNECTOR	24PIN	
CN9	SCV1815-026X	CONNECTOR	26PIN	
K1 – K34	SCV2662-027	FERRITE BEADS		

5.4 ISB/ISG/ISR BOARD ASSEMBLY LIST 04/05/06

SCK2477-03-00A (ISB) 04☐☐☐☐☐☐
SCK2477-04-00A (ISG) 05☐☐☐☐☐☐
SCK2477-05-00A (ISR) 06☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
IC1	UPD3602D-10	I.C.(M)	NEC
SK1	SCV2769-001	IC SOCKET	for IC1
IC2	TC74HC04AF-X	I.C.(M)	TOSHIBA
IC3	AD8011AR-X	I.C.(M)	ANALOG DEVICES
IC4	OPA655U-XE	I.C.(M)	BBJ
IC5	LMC6082IM-X	I.C.(M)	NATIONAL SEMICO
IC7	AD603AR-X	I.C.(M)	ANALOG DEVICES
IC8	TC4S66F-X	I.C.(M)	TOSHIBA
Q1	2SA1226T2B	TRANSISTOR	NEC
Q2	3SK157/4-6/-W	FET	NEC
Q3	3SK157/4-6/-W	FET	NEC
Q4	3SK157/4-6/-W	FET	NEC
Q5	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q6	3SK157/4-6/-W	FET	NEC
Q7	DTA124EUA-X	TRANSISTOR	ROHM
Q8	DTC124EUA-X	TRANSISTOR	ROHM
Q101	2SJ364/QR/-X	FET	MATSUSHITA
D1	HSM198S-W	DIODE	HITACHI
R1	NRSA63F-220X-T	M.G.RESISTOR	22 1/16W
R2	NRSA63F-332X-T	M.G.RESISTOR	3.3k 1/16W
R3	NRSA63F-105X-T	M.G.RESISTOR	1M 1/16W
R4	NRSA63F-332X-T	M.G.RESISTOR	3.3k 1/16W
R5	NRSA63F-100X-T	M.G.RESISTOR	10 1/16W
R6	NRSA63F-100X-T	M.G.RESISTOR	10 1/16W
R7	NRSA63F-100X-T	M.G.RESISTOR	10 1/16W
R8	NRSA63F-100X-T	M.G.RESISTOR	10 1/16W
R9	NRSA63F-100X-T	M.G.RESISTOR	10 1/16W
R11	NRSA63J-0R0X	M.G.RESISTOR	0 (for ISB/G) 1/16W
R13	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R14	NRSA63F-224X-T	M.G.RESISTOR	220k 1/16W
R15	NRSA63F-152X-T	M.G.RESISTOR	1.5k 1/16W
R16	NRSA63F-391X-T	M.G.RESISTOR	390 (for ISB/R) 1/16W
	NRSA63F-471X-T	M.G.RESISTOR	470 (for ISG) 1/16W
R18	NRSA63F-102X-T	M.G.RESISTOR	1k 1/16W
R19	NRSA63F-181X-T	M.G.RESISTOR	180 1/16W
R20	NRSA63F-181X-T	M.G.RESISTOR	180 1/16W
R21	NRSA63F-101X-T	M.G.RESISTOR	100 1/16W
R22	NRSA63F-101X-T	M.G.RESISTOR	100 1/16W
R23	NRSA63F-222X-T	M.G.RESISTOR	2.2k 1/16W
R24	NRSA63F-122X-T	M.G.RESISTOR	1.2k 1/16W
R25	NRSA63F-822X-T	M.G.RESISTOR	8.2k (for ISB) 1/16W
	NRSA63F-152X-T	M.G.RESISTOR	1.5k (for ISG) 1/16W
	NRSA63F-222X-T	M.G.RESISTOR	2.2k (for ISR) 1/16W
R26	NRSA63F-102X-T	M.G.RESISTOR	1k (for ISB) 1/16W
	NRSA63J-0R0X	M.G.RESISTOR	0 (for ISG) 1/16W
	NRSA63F-151X-T	M.G.RESISTOR	150 (for ISR) 1/16W
R27	NRSA63J-105X	M.G.RESISTOR	1M 1/16W
R28	NRSA63F-104X-T	M.G.RESISTOR	100k 1/16W
R29	NRSA63F-223X-T	M.G.RESISTOR	22k 1/16W
R30	NRSA63J-105X	M.G.RESISTOR	1M 1/16W
R31	NRSA63F-563X-T	M.G.RESISTOR	56k 1/16W
R32	NRSA63F-102X-T	M.G.RESISTOR	1k 1/16W

Symbol No.	Part No.	Part Name	Description
R33	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R34	NRSA63F-102X-T	M.G.RESISTOR	1k 1/16W
R101	NRSA63F-101X-T	M.G.RESISTOR	100 1/16W
R102	NRSA63F-102X-T	M.G.RESISTOR	1k 1/16W
C1	NBE21AM-106X	TAN.CAPACITOR	10 10V
C2	NBE21AM-106X	TAN.CAPACITOR	10 10V
C3	NBE21EM-105X	TAN.CAPACITOR	1 25V
C6	NBE21CM-225X	TAN.CAPACITOR	2.2 16V
C7	NEE51VM-335NY	E.CAPACITOR	3.3 35V
C8	NCB31EK-103X	CER.CAPACITOR	0.01 25V
C9	NCB31EK-103X	CER.CAPACITOR	0.01 25V
C10	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C11	NDC31HJ-680X	CER.CAPACITOR	68p 50V
C12	NBE21CM-225X	TAN.CAPACITOR	2.2 16V
C13	NBE21CM-225X	TAN.CAPACITOR	2.2 16V
C14	NDC31HJ-150X	CER.CAPACITOR	15p 50V
C15	NDC31HJ-150X	CER.CAPACITOR	15p 50V
C16	NBE21CM-225X	TAN.CAPACITOR	2.2 16V
C17	NBE21CM-225X	TAN.CAPACITOR	2.2 16V
C19	NBE21CM-225X	TAN.CAPACITOR	2.2 16V
C20	NBE21CM-225X	TAN.CAPACITOR	2.2 16V
C21	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C22	NCB31CK-823X	CER.CAPACITOR	0.082 16V
C23	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C24	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C25	NDC31HJ-100X	CER.CAPACITOR	10p (for ISB) 50V
	NDC31HJ-151X	CER.CAPACITOR	150p (for ISR) 50V
C101	NDC31HJ-680X	CER.CAPACITOR	68p (for ISB/R) 50V
CN3	SCV1770-005	CONNECTOR	5PIN (for ISB)
CN4	SCV1770-005	CONNECTOR	5PIN (for ISG)
CN5	SCV1770-005	CONNECTOR	5PIN (for ISR)
CN6	SCV2477-024	CONNECTOR	24PIN (for ISB)
CN7	SCV2644-124X	CONNECTOR	24PIN (for ISG)
CN8	SCV2477-024	CONNECTOR	24PIN (for ISR)
LC101	SCV2596-S144Z	FILTER	14MHz
K1	SCV2662-027	FERRITE BEADS	
K3	SCV2662-027	FERRITE BEADS	
K4	SCV2662-027	FERRITE BEADS	
K5	SCV2662-027	FERRITE BEADS	

5.5 PA BOARD ASSEMBLY LIST 0 7

SCK2477-06-00A

0 7 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description	
IC1	MB88345PF	I.C.(M)	FUJITSU	
IC2	TC7S08F-X	I.C.(M)	TOSHIBA	
IC101	AD8011AR-X	I.C.(M)	ANALOG DEVICES	
IC102	TC4W53F-X	I.C.(M)	TOSHIBA	
IC103	AD8041AR-XE	I.C.(M)	ANALOG DEVICES	
IC106	NJM062M-X	I.C.(M)	JRC	
IC107	TC4S66F-X	I.C.(M)	TOSHIBA	
IC108	NJM062M-X	I.C.(M)	JRC	
IC201	AD8011AR-X	I.C.(M)	ANALOG DEVICES	
IC202	TC4W53F-X	I.C.(M)	TOSHIBA	
IC203	AD8041AR-XE	I.C.(M)	ANALOG DEVICES	
IC207	TC4S66F-X	I.C.(M)	TOSHIBA	
IC208	NJM062M-X	I.C.(M)	JRC	
IC301	AD8011AR-X	I.C.(M)	ANALOG DEVICES	
IC302	TC4W53F-X	I.C.(M)	TOSHIBA	
IC303	AD8041AR-XE	I.C.(M)	ANALOG DEVICES	
IC306	NJM062M-X	I.C.(M)	JRC	
IC307	TC4S66F-X	I.C.(M)	TOSHIBA	
IC308	NJM062M-X	I.C.(M)	JRC	
Q1	MSC3930/B/-X	TRANSISTOR	MOTOROLA	
Q2	MSC3930/B/-X	TRANSISTOR	MOTOROLA	
Q3	DTA124EUA-X	TRANSISTOR	ROHM	
Q4	2SB1219/QR/-X	TRANSISTOR	MATSUSHITA	
Q5	2SA1532/BC/-X	TRANSISTOR	MATSUSHITA	
Q6	MSC3930/B/-X	TRANSISTOR	MOTOROLA	
Q101	2SA1532/BC/-X	TRANSISTOR	MATSUSHITA	
Q102	2SA1532/BC/-X	TRANSISTOR	MATSUSHITA	
Q103	MSC3930/B/-X	TRANSISTOR	MOTOROLA	
Q104	2SA1532/BC/-X	TRANSISTOR	MATSUSHITA	
Q105	2SJ364/QR/-X	FET	MATSUSHITA	
Q106	DTC124EUA-X	TRANSISTOR	ROHM	
Q201	2SA1532/BC/-X	TRANSISTOR	MATSUSHITA	
Q202	2SA1532/BC/-X	TRANSISTOR	MATSUSHITA	
Q203	MSC3930/B/-X	TRANSISTOR	MOTOROLA	
Q204	2SA1532/BC/-X	TRANSISTOR	MATSUSHITA	
Q205	2SJ364/QR/-X	FET	MATSUSHITA	
Q206	DTC124EUA-X	TRANSISTOR	ROHM	
Q301	2SA1532/BC/-X	TRANSISTOR	MATSUSHITA	
Q302	2SA1532/BC/-X	TRANSISTOR	MATSUSHITA	
Q303	MSC3930/B/-X	TRANSISTOR	MOTOROLA	
Q304	2SA1532/BC/-X	TRANSISTOR	MATSUSHITA	
Q305	2SJ364/QR/-X	FET	MATSUSHITA	
Q306	DTC124EUA-X	TRANSISTOR	ROHM	
D102	MA742-X	DIODE	MATSUSHITA	
D103	MA111-X	DIODE	MATSUSHITA	
D104	MA111-X	DIODE	MATSUSHITA	
D202	MA742-X	DIODE	MATSUSHITA	
D203	MA111-X	DIODE	MATSUSHITA	
D204	MA111-X	DIODE	MATSUSHITA	
D302	MA742-X	DIODE	MATSUSHITA	
D303	MA111-X	DIODE	MATSUSHITA	
D304	MA111-X	DIODE	MATSUSHITA	
R1	NRSA63F-562X-T	M.G.RESISTOR	5.6k	1/16W
R2	NRSA63F-223X-T	M.G.RESISTOR	22k	1/16W
R3	NRSA63F-392X-T	M.G.RESISTOR	3.9k	1/16W
R4	NRSA63F-472X-T	M.G.RESISTOR	4.7k	1/16W
R5	NRSA63F-103X-T	M.G.RESISTOR	10k	1/16W
R6	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R7	NRSA63F-221X-T	M.G.RESISTOR	220	1/16W
R8	NRSA63F-103X-T	M.G.RESISTOR	10k	1/16W
R11	NRSA63F-393X-T	M.G.RESISTOR	39k	1/16W
R12	NRSA63F-682X-T	M.G.RESISTOR	6.8k	1/16W
R23	NRSA63F-122X-T	M.G.RESISTOR	1.2k	1/16W
R24	NRSA63F-122X-T	M.G.RESISTOR	1.2k	1/16W
R25	NRSA63F-563X-T	M.G.RESISTOR	56k	1/16W
R26	NRSA63F-273X-T	M.G.RESISTOR	27k	1/16W
R101	NRSA63F-222X-T	M.G.RESISTOR	2.2k	1/16W
R102	NRSA63F-471X-T	M.G.RESISTOR	470	1/16W
R103	NRSA63F-271X-T	M.G.RESISTOR	270	1/16W
R104	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R105	NRSA63F-100X-T	M.G.RESISTOR	10	1/16W
R106	NRSA63F-221X-T	M.G.RESISTOR	220	1/16W
R107	NRSA63F-681X-T	M.G.RESISTOR	680	1/16W
R108	NRSA63F-221X-T	M.G.RESISTOR	220	1/16W
R109	NRSA63F-680X-T	M.G.RESISTOR	68	1/16W
R110	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R113	NRSA63F-272X-T	M.G.RESISTOR	2.7k	1/16W
R114	NRSA63F-220X-T	M.G.RESISTOR	22	1/16W
R115	NRSA63F-152X-T	M.G.RESISTOR	1.5k	1/16W
R116	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R117	NRSA63F-181X-T	M.G.RESISTOR	180	1/16W
R135	NRSA63F-274X-T	M.G.RESISTOR	270k	1/16W
R136	NRSA63F-274X-T	M.G.RESISTOR	270k	1/16W
R137	NRSA63F-124X-T	M.G.RESISTOR	120k	1/16W
R138	NRSA63F-224X-T	M.G.RESISTOR	220k	1/16W
R139	NRSA63F-124X-T	M.G.RESISTOR	120k	1/16W
R140	NRSA63F-183X-T	M.G.RESISTOR	18k	1/16W
R141	NRSA63F-274X-T	M.G.RESISTOR	270k	1/16W
R142	NRSA63F-363X-T	M.G.RESISTOR	36k	1/16W
R143	NRSA63F-104X-T	M.G.RESISTOR	100k	1/16W
R144	NRSA63F-104X-T	M.G.RESISTOR	100k	1/16W
R145	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R146	NRSA63F-821X-T	M.G.RESISTOR	820	1/16W
R147	NRSA63F-821X-T	M.G.RESISTOR	820	1/16W
R148	NRSA63F-822X-T	M.G.RESISTOR	8.2k	1/16W
R149	NRSA63F-243X-T	M.G.RESISTOR	24k	1/16W
R150	NRSA63F-103X-T	M.G.RESISTOR	10k	1/16W
R151	NRSA63F-752X-T	M.G.RESISTOR	7.5k	1/16W
R152	NRSA63F-822X-T	M.G.RESISTOR	8.2k	1/16W
R153	NRSA63F-823X-T	M.G.RESISTOR	82k	1/16W
R154	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R155	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R156	NRSA63F-304X-T	M.G.RESISTOR	300k	1/16W
R157	NRSA63F-152X-T	M.G.RESISTOR	1.5k	1/16W
R158	NRSA63F-472X-T	M.G.RESISTOR	4.7k	1/16W
R159	NRSA63F-332X-T	M.G.RESISTOR	3.3k	1/16W
R161	NRSA63F-272X-T	M.G.RESISTOR	2.7k	1/16W
R164	NRSA63F-272X-T	M.G.RESISTOR	2.7k	1/16W
R165	NRSA63F-100X-T	M.G.RESISTOR	10	1/16W
R166	NRSA63F-100X-T	M.G.RESISTOR	10	1/16W
R201	NRSA63F-222X-T	M.G.RESISTOR	2.2k	1/16W
R202	NRSA63F-471X-T	M.G.RESISTOR	470	1/16W
R203	NRSA63F-271X-T	M.G.RESISTOR	270	1/16W
R204	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R205	NRSA63F-100X-T	M.G.RESISTOR	10	1/16W

[PA]

Symbol No.	Part No.	Part Name	Description	
R206	NRSA63F-221X-T	M.G.RESISTOR	220	1/16W
R207	NRSA63F-681X-T	M.G.RESISTOR	680	1/16W
R208	NRSA63F-221X-T	M.G.RESISTOR	220	1/16W
R209	NRSA63F-680X-T	M.G.RESISTOR	68	1/16W
R210	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R213	NRSA63F-272X-T	M.G.RESISTOR	2.7k	1/16W
R214	NRSA63F-220X-T	M.G.RESISTOR	22	1/16W
R215	NRSA63F-152X-T	M.G.RESISTOR	1.5k	1/16W
R216	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R217	NRSA63F-181X-T	M.G.RESISTOR	180	1/16W
R236	NRSA63F-274X-T	M.G.RESISTOR	270k	1/16W
R237	NRSA63F-124X-T	M.G.RESISTOR	120k	1/16W
R238	NRSA63F-334X-T	M.G.RESISTOR	330k	1/16W
R239	NRSA63F-124X-T	M.G.RESISTOR	120k	1/16W
R240	NRSA63F-183X-T	M.G.RESISTOR	18k	1/16W
R241	NRSA63F-274X-T	M.G.RESISTOR	270k	1/16W
R242	NRSA63F-363X-T	M.G.RESISTOR	36k	1/16W
R243	NRSA63F-104X-T	M.G.RESISTOR	100k	1/16W
R244	NRSA63F-104X-T	M.G.RESISTOR	100k	1/16W
R245	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R246	NRSA63F-821X-T	M.G.RESISTOR	820	1/16W
R247	NRSA63F-821X-T	M.G.RESISTOR	820	1/16W
R248	NRSA63F-822X-T	M.G.RESISTOR	8.2k	1/16W
R249	NRSA63F-393X-T	M.G.RESISTOR	39k	1/16W
R250	NRSA63F-103X-T	M.G.RESISTOR	10k	1/16W
R251	NRSA63F-752X-T	M.G.RESISTOR	7.5k	1/16W
R252	NRSA63F-123X-T	M.G.RESISTOR	12k	1/16W
R253	NRSA63F-273X-T	M.G.RESISTOR	27k	1/16W
R254	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R255	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R256	NRSA63F-334X-T	M.G.RESISTOR	330k	1/16W
R257	NRSA63F-152X-T	M.G.RESISTOR	1.5k	1/16W
R258	NRSA63F-472X-T	M.G.RESISTOR	4.7k	1/16W
R259	NRSA63F-332X-T	M.G.RESISTOR	3.3k	1/16W
R261	NRSA63F-272X-T	M.G.RESISTOR	2.7k	1/16W
R264	NRSA63F-272X-T	M.G.RESISTOR	2.7k	1/16W
R265	NRSA63F-100X-T	M.G.RESISTOR	10	1/16W
R266	NRSA63F-100X-T	M.G.RESISTOR	10	1/16W
R301	NRSA63F-222X-T	M.G.RESISTOR	2.2k	1/16W
R302	NRSA63F-471X-T	M.G.RESISTOR	470	1/16W
R303	NRSA63F-271X-T	M.G.RESISTOR	270	1/16W
R304	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R305	NRSA63F-100X-T	M.G.RESISTOR	10	1/16W
R306	NRSA63F-221X-T	M.G.RESISTOR	220	1/16W
R307	NRSA63F-681X-T	M.G.RESISTOR	680	1/16W
R308	NRSA63F-221X-T	M.G.RESISTOR	220	1/16W
R309	NRSA63F-680X-T	M.G.RESISTOR	68	1/16W
R310	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R313	NRSA63F-272X-T	M.G.RESISTOR	2.7k	1/16W
R314	NRSA63F-220X-T	M.G.RESISTOR	22	1/16W
R315	NRSA63F-152X-T	M.G.RESISTOR	1.5k	1/16W
R316	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R317	NRSA63F-181X-T	M.G.RESISTOR	180	1/16W
R335	NRSA63F-274X-T	M.G.RESISTOR	270k	1/16W
R336	NRSA63F-274X-T	M.G.RESISTOR	270k	1/16W
R337	NRSA63F-124X-T	M.G.RESISTOR	120k	1/16W
R338	NRSA63F-224X-T	M.G.RESISTOR	220k	1/16W
R339	NRSA63F-124X-T	M.G.RESISTOR	120k	1/16W
R340	NRSA63F-183X-T	M.G.RESISTOR	18k	1/16W

Symbol No.	Part No.	Part Name	Description	
R341	NRSA63F-274X-T	M.G.RESISTOR	270k	1/16W
R342	NRSA63F-363X-T	M.G.RESISTOR	36k	1/16W
R343	NRSA63F-104X-T	M.G.RESISTOR	100k	1/16W
R344	NRSA63F-104X-T	M.G.RESISTOR	100k	1/16W
R345	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R346	NRSA63F-821X-T	M.G.RESISTOR	820	1/16W
R347	NRSA63F-821X-T	M.G.RESISTOR	820	1/16W
R348	NRSA63F-822X-T	M.G.RESISTOR	8.2k	1/16W
R349	NRSA63F-183X-T	M.G.RESISTOR	18k	1/16W
R350	NRSA63F-183X-T	M.G.RESISTOR	18k	1/16W
R351	NRSA63F-752X-T	M.G.RESISTOR	7.5k	1/16W
R352	NRSA63F-103X-T	M.G.RESISTOR	10k	1/16W
R353	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
R354	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R355	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R356	NRSA63F-304X-T	M.G.RESISTOR	300k	1/16W
R357	NRSA63F-152X-T	M.G.RESISTOR	1.5k	1/16W
R358	NRSA63F-472X-T	M.G.RESISTOR	4.7k	1/16W
R359	NRSA63F-332X-T	M.G.RESISTOR	3.3k	1/16W
R361	NRSA63F-272X-T	M.G.RESISTOR	2.7k	1/16W
R364	NRSA63F-272X-T	M.G.RESISTOR	2.7k	1/16W
R365	NRSA63F-100X-T	M.G.RESISTOR	10	1/16W
R366	NRSA63F-100X-T	M.G.RESISTOR	10	1/16W
C1	NBE41CM-106X	TAN.CAPACITOR	10	16V
C2	NBE21AM-106X	TAN.CAPACITOR	10	10V
C3	NBE21AM-106X	TAN.CAPACITOR	10	10V
C5	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C6	NBE41AM-226X	TAN.CAPACITOR	22	10V
C7	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C9	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C103	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C104	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C105	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C106	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C112	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C113	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C114	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C115	NDC31HJ-680X	CER.CAPACITOR	68p	50V
C203	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C204	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C205	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C206	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C212	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C213	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C214	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C215	NDC31HJ-680X	CER.CAPACITOR	68p	50V
C303	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C304	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C305	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C306	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C312	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C313	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C314	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C315	NDC31HJ-680X	CER.CAPACITOR	68p	50V
LC101	SCV2597-S144Z	FILTER	14MHz	
LC201	SCV2597-S144Z	FILTER	14MHz	

5.6 DPR1 BOARD ASSEMBLY LIST 08
SCK2482-00A
SCK2482-P0A

08□□□□□□

Symbol No.	Part No.	Part Name	Description
LC301	SCV2597-S144Z	FILTER	14MHz
CN1	SCV1770-006	CONNECTOR	6PIN
CN3	SCV1770-005	CONNECTOR	5PIN
CN4	SCV1770-005	CONNECTOR	5PIN
CN5	SCV1770-005	CONNECTOR	5PIN
CN21	SCV1770-014	CONNECTOR	14PIN
CN36	SCV1770-012	CONNECTOR	12PIN
TP101	SCV1880-001	TEST POINT	
TP102	SCV1880-001	TEST POINT	
TP201	SCV1880-001	TEST POINT	
TP202	SCV1880-001	TEST POINT	
TP301	SCV1880-001	TEST POINT	
TP302	SCV1880-001	TEST POINT	

Symbol No.	Part No.	Part Name	Description
IC101	AD8011AR-X	I.C.(M)	ANALOG DEVICES
IC102	LMC6082IM-X	I.C.(M)	NATIONAL SEMICO
IC103	ADS820U-X	I.C.(M)	BBJ
IC201	AD8011AR-X	I.C.(M)	ANALOG DEVICES
IC202	ADS820U-X	I.C.(M)	BBJ
IC301	AD8011AR-X	I.C.(M)	ANALOG DEVICES
IC302	LMC6082IM-X	I.C.(M)	NATIONAL SEMICO
IC303	ADS820U-X	I.C.(M)	BBJ
IC401	JCS0039	I.C.(M)	JVC
IC402	MN47V77S-XE	I.C.(M)	MATSUSHITA
IC403	MN47V77S-XE	I.C.(M)	MATSUSHITA
IC404	MN47V77S-XE	I.C.(M)	MATSUSHITA
IC405	MN47V77S-XE	I.C.(M)	MATSUSHITA
IC406	HM63021FP-S	I.C.(M)	HITACHI
IC407	HM63021FP-S	I.C.(M)	HITACHI
IC408	HM63021FP-S	I.C.(M)	HITACHI
IC409	HM63021FP-S	I.C.(M)	HITACHI
IC410	HM63021FP-S	I.C.(M)	HITACHI
IC501	TC7SH00FU-X	I.C.(M)	TOSHIBA
IC502	TC74VHC125FS-X	I.C.(M)	TOSHIBA
IC503	TC74VHC04FS-X	I.C.(M)	TOSHIBA
IC504	TC74VHC74FS-X	I.C.(M)	TOSHIBA
IC505	TC74VHC74FS-X	I.C.(M)	TOSHIBA
IC506	TC74VHC74FS-X	I.C.(M)	TOSHIBA
IC507	TC74VHC74FS-X	I.C.(M)	TOSHIBA
IC508	TC74VHC74FS-X	I.C.(M)	TOSHIBA
IC509	TC74VHC74FS-X	I.C.(M)	TOSHIBA
IC601	TC74VHCT04FS-X	I.C.(M)	TOSHIBA
IC602	SN74LS07DB-XE	I.C.(M)	TEXAS
IC603	TMS57106PCE	I.C.(M)	TEXAS
IC701	JCS0039	I.C.(M)	JVC
IC801	TC74VHC574FS-X	I.C.(M)	TOSHIBA
IC802	TC74VHC125FS-X	I.C.(M)	TOSHIBA
IC803	TC74VHC175FS-X	I.C.(M)	TOSHIBA
IC804	TC74VHC574FS-X	I.C.(M)	TOSHIBA
IC805	TC74VHC574FS-X	I.C.(M)	TOSHIBA
IC806	TC74VHC574FS-X	I.C.(M)	TOSHIBA
IC807	TC74VHC574FS-X	I.C.(M)	TOSHIBA
IC808	CXD2307R-X	I.C.(M)	SONY
Q101	3SK157/4-6/-W	FET	NEC
Q201	3SK157/4-6/-W	FET	NEC
Q301	3SK157/4-6/-W	FET	NEC
Q302	2SA1532/BC/-X	TRANSISTOR	MATSUSHITA
Q801	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q802	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q803	MSC3930/B/-X	TRANSISTOR	MOTOROLA
D101	MA142A-X	DIODE	MATSUSHITA
D201	MA142A-X	DIODE	MATSUSHITA
D301	MA142A-X	DIODE	MATSUSHITA
R102	NRSA63F-821X-T	M.G.RESISTOR	820 1/16W
R104	NRSA63F-392X-T	M.G.RESISTOR	3.9k 1/16W
R105	NRSA63F-102X-T	M.G.RESISTOR	1k 1/16W
R107	NRSA63F-221X-T	M.G.RESISTOR	220 1/16W
R108	NRSA63F-823X-T	M.G.RESISTOR	82k 1/16W
R109	NRSA63F-102X-T	M.G.RESISTOR	1k 1/16W
R110	NRSA63F-752X-T	M.G.RESISTOR	7.5k 1/16W

[DPR1]

Symbol No.	Part No.	Part Name	Description
R111	NRSA63F–102X–T	M.G.RESISTOR	1k 1/16W
R112	NRSA63F–470X–T	M.G.RESISTOR	47 1/16W
R113	NRSA63F–102X–T	M.G.RESISTOR	1k 1/16W
R114	NRSA63F–154X–T	M.G.RESISTOR	150k 1/16W
R115	NRSA63F–823X–T	M.G.RESISTOR	82k 1/16W
R116	NRSA63F–393X–T	M.G.RESISTOR	39k 1/16W
R117	NRSA63F–223X–T	M.G.RESISTOR	22k 1/16W
R118	NRSA63F–103X–T	M.G.RESISTOR	10k 1/16W
R119	NRSA63F–472X–T	M.G.RESISTOR	4.7k 1/16W
R120	NRSA63F–821X–T	M.G.RESISTOR	820 1/16W
R126	NRSA63F–682X–T	M.G.RESISTOR	6.8k 1/16W
R202	NRSA63F–821X–T	M.G.RESISTOR	820 1/16W
R204	NRSA63F–392X–T	M.G.RESISTOR	3.9k 1/16W
R205	NRSA63F–102X–T	M.G.RESISTOR	1k 1/16W
R207	NRSA63F–221X–T	M.G.RESISTOR	220 1/16W
R208	NRSA63F–823X–T	M.G.RESISTOR	82k 1/16W
R209	NRSA63F–102X–T	M.G.RESISTOR	1k 1/16W
R210	NRSA63F–752X–T	M.G.RESISTOR	7.5k 1/16W
R211	NRSA63F–102X–T	M.G.RESISTOR	1k 1/16W
R212	NRSA63F–470X–T	M.G.RESISTOR	47 1/16W
R213	NRSA63F–102X–T	M.G.RESISTOR	1k 1/16W
R214	NRSA63F–154X–T	M.G.RESISTOR	150k 1/16W
R215	NRSA63F–823X–T	M.G.RESISTOR	82k 1/16W
R216	NRSA63F–393X–T	M.G.RESISTOR	39k 1/16W
R217	NRSA63F–223X–T	M.G.RESISTOR	22k 1/16W
R218	NRSA63F–103X–T	M.G.RESISTOR	10k 1/16W
R219	NRSA63F–472X–T	M.G.RESISTOR	4.7k 1/16W
R220	NRSA63F–821X–T	M.G.RESISTOR	820 1/16W
R226	NRSA63F–682X–T	M.G.RESISTOR	6.8k 1/16W
R302	NRSA63F–821X–T	M.G.RESISTOR	820 1/16W
R304	NRSA63F–392X–T	M.G.RESISTOR	3.9k 1/16W
R305	NRSA63F–102X–T	M.G.RESISTOR	1k 1/16W
R307	NRSA63F–221X–T	M.G.RESISTOR	220 1/16W
R308	NRSA63F–823X–T	M.G.RESISTOR	82k 1/16W
R309	NRSA63F–102X–T	M.G.RESISTOR	1k 1/16W
R310	NRSA63F–752X–T	M.G.RESISTOR	7.5k 1/16W
R311	NRSA63F–102X–T	M.G.RESISTOR	1k 1/16W
R312	NRSA63F–470X–T	M.G.RESISTOR	47 1/16W
R313	NRSA63F–102X–T	M.G.RESISTOR	1k 1/16W
R314	NRSA63F–154X–T	M.G.RESISTOR	150k 1/16W
R315	NRSA63F–823X–T	M.G.RESISTOR	82k 1/16W
R316	NRSA63F–393X–T	M.G.RESISTOR	39k 1/16W
R317	NRSA63F–223X–T	M.G.RESISTOR	22k 1/16W
R318	NRSA63F–103X–T	M.G.RESISTOR	10k 1/16W
R319	NRSA63F–472X–T	M.G.RESISTOR	4.7k 1/16W
R320	NRSA63F–821X–T	M.G.RESISTOR	820 1/16W
R321	NRSA63F–184X–T	M.G.RESISTOR	180k 1/16W
R322	NRSA63F–184X–T	M.G.RESISTOR	180k 1/16W
R323	NRSA63F–682X–T	M.G.RESISTOR	6.8k 1/16W
R324	NRSA63F–104X–T	M.G.RESISTOR	100k 1/16W
R325	NRSA63F–473X–T	M.G.RESISTOR	47k 1/16W
R326	NRSA63F–682X–T	M.G.RESISTOR	6.8k 1/16W
R327	NRSA63F–222X–T	M.G.RESISTOR	2.2k 1/16W
R328	NRSA63F–102X–T	M.G.RESISTOR	1k 1/16W
R329	NRSA63F–153X–T	M.G.RESISTOR	15k 1/16W
R330	NRSA63F–103X–T	M.G.RESISTOR	10k 1/16W
R401	NRSA63J–0R0X	M.G.RESISTOR	0 1/16W
R402	NRSA63J–0R0X	M.G.RESISTOR	0 1/16W
R403	NRSA63J–0R0X	M.G.RESISTOR	0 1/16W
R404	NRSA63J–0R0X	M.G.RESISTOR	0 1/16W
R405	NRSA63J–0R0X	M.G.RESISTOR	0 1/16W
R406	NRSA63F–103X–T	M.G.RESISTOR	10k 1/16W
R407	NRSA63F–102X–T	M.G.RESISTOR	1k 1/16W
R408	NRSA63J–0R0X	M.G.RESISTOR	0 1/16W
R411	NRSA63F–272X–T	M.G.RESISTOR	2.7k 1/16W
R412	NRSA63F–333X–T	M.G.RESISTOR	33k 1/16W
R413	NRSA63F–183X–T	M.G.RESISTOR	18k 1/16W
R414	NRSA63F–152X–T	M.G.RESISTOR	1.5k 1/16W
R415	NRSA63F–222X–T	M.G.RESISTOR	2.2k 1/16W
R416	NRSA63F–222X–T	M.G.RESISTOR	2.2k 1/16W
R417	NRSA63F–222X–T	M.G.RESISTOR	2.2k 1/16W
R418	NRSA63F–222X–T	M.G.RESISTOR	2.2k 1/16W
R419	NRSA63F–103X–T	M.G.RESISTOR	10k 1/16W
R420	NRSA63F–222X–T	M.G.RESISTOR	2.2k 1/16W
R421	NRSA63F–222X–T	M.G.RESISTOR	2.2k 1/16W
R422	NRSA63F–222X–T	M.G.RESISTOR	2.2k 1/16W
R423	NRSA63F–222X–T	M.G.RESISTOR	2.2k 1/16W
R424	NRSA63F–222X–T	M.G.RESISTOR	2.2k 1/16W
R425	NRSA63F–222X–T	M.G.RESISTOR	2.2k 1/16W
R426	NRSA63F–222X–T	M.G.RESISTOR	2.2k 1/16W
R427	NRSA63F–222X–T	M.G.RESISTOR	2.2k 1/16W
R428	NRSA63F–222X–T	M.G.RESISTOR	2.2k 1/16W
R429	NRSA63F–222X–T	M.G.RESISTOR	2.2k 1/16W
R430	NRSA63F–222X–T	M.G.RESISTOR	2.2k 1/16W
R431	NRSA63F–222X–T	M.G.RESISTOR	2.2k 1/16W
R432	NRSA63F–222X–T	M.G.RESISTOR	2.2k 1/16W
R433	NRSA63F–222X–T	M.G.RESISTOR	2.2k 1/16W
R434	NRSA63F–222X–T	M.G.RESISTOR	2.2k 1/16W
R435	NRSA63F–222X–T	M.G.RESISTOR	2.2k 1/16W
R438	NRSA63F–103X–T	M.G.RESISTOR	10k 1/16W
R439	NRSA63F–103X–T	M.G.RESISTOR	10k 1/16W
R440	NRSA63F–103X–T	M.G.RESISTOR	10k 1/16W
R501	NRSA63F–681X–T	M.G.RESISTOR	680 1/16W
R502	NRSA63F–104X–T	M.G.RESISTOR	100k 1/16W
R504	NRSA63J–0R0X	M.G.RESISTOR	0 1/16W
R506	NRSA63J–0R0X	M.G.RESISTOR	0 1/16W
R507	NRSA63F–332X–T	M.G.RESISTOR	3.3k 1/16W
R508	NRSA63F–332X–T	M.G.RESISTOR	3.3k 1/16W
R509	NRSA63F–332X–T	M.G.RESISTOR	3.3k 1/16W
R510	NRSA63F–332X–T	M.G.RESISTOR	3.3k 1/16W
R511	NRSA63F–332X–T	M.G.RESISTOR	3.3k 1/16W
R513	NRSA63J–0R0X	M.G.RESISTOR	0 1/16W
R515	NRSA63J–0R0X	M.G.RESISTOR	0 1/16W
R517	NRSA63J–0R0X	M.G.RESISTOR	0 1/16W
R519	NRSA63J–0R0X	M.G.RESISTOR	0 1/16W
R520	NRSA63F–332X–T	M.G.RESISTOR	3.3k 1/16W
R521	NRSA63F–332X–T	M.G.RESISTOR	3.3k 1/16W
R522	NRSA63F–222X–T	M.G.RESISTOR	2.2k 1/16W
R523	NRSA63F–100X–T	M.G.RESISTOR	10 1/16W
R526	NRSA63J–0R0X	M.G.RESISTOR	0 1/16W
R527	NRSA63J–0R0X	M.G.RESISTOR	0 1/16W
R529	NRSA63J–0R0X	M.G.RESISTOR	0 1/16W
R531	NRSA63F–332X–T	M.G.RESISTOR	3.3k 1/16W
R532	NRSA63F–332X–T	M.G.RESISTOR	3.3k 1/16W
R533	NRSA63F–332X–T	M.G.RESISTOR	3.3k 1/16W
R534	NRSA63F–222X–T	M.G.RESISTOR	2.2k 1/16W
R535	NRSA63F–100X–T	M.G.RESISTOR	10 1/16W
R537	NRSA63J–0R0X	M.G.RESISTOR	0 1/16W (E)

Symbol No.	Part No.	Part Name	Description
R538	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W(U)
R539	NRSA63F-332X-T	M.G.RESISTOR	3.3k 1/16W
R540	NRSA63F-332X-T	M.G.RESISTOR	3.3k 1/16W
R601	NRSA63F-103X-T	M.G.RESISTOR	10k 1/16W
R602	NRSA63F-103X-T	M.G.RESISTOR	10k 1/16W
R603	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R604	NRSA63F-332X-T	M.G.RESISTOR	3.3k 1/16W
R606	NRSA63F-103X-T	M.G.RESISTOR	10k 1/16W
R607	NRSA63F-103X-T	M.G.RESISTOR	10k 1/16W
R608	NRSA63F-103X-T	M.G.RESISTOR	10k 1/16W
R609	NRSA63F-472X-T	M.G.RESISTOR	4.7k 1/16W
R610	NRSA63F-472X-T	M.G.RESISTOR	4.7k 1/16W
R611	NRSA63F-472X-T	M.G.RESISTOR	4.7k 1/16W
R612	NRSA63F-472X-T	M.G.RESISTOR	4.7k 1/16W
R613	NRSA63F-472X-T	M.G.RESISTOR	4.7k 1/16W
R614	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R615	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R618	NRSA63F-103X-T	M.G.RESISTOR	10k 1/16W
R619	NRSA63F-103X-T	M.G.RESISTOR	10k 1/16W
R620	NRSA63F-103X-T	M.G.RESISTOR	10k 1/16W
R621	NRSA63F-103X-T	M.G.RESISTOR	10k 1/16W
R622	NRSA63F-103X-T	M.G.RESISTOR	10k 1/16W
R623	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W(U)
R624	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W(E)
R701	NRSA63F-472X-T	M.G.RESISTOR	4.7k 1/16W
R702	NRSA63F-472X-T	M.G.RESISTOR	4.7k 1/16W
R703	NRSA63F-472X-T	M.G.RESISTOR	4.7k 1/16W
R704	NRSA63F-472X-T	M.G.RESISTOR	4.7k 1/16W
R705	NRSA63F-472X-T	M.G.RESISTOR	4.7k 1/16W
R706	NRSA63F-472X-T	M.G.RESISTOR	4.7k 1/16W
R707	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R708	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R709	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R710	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R711	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R712	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R716	NRSA63F-333X-T	M.G.RESISTOR	33k 1/16W
R717	NRSA63F-152X-T	M.G.RESISTOR	1.5k 1/16W
R718	NRSA63F-183X-T	M.G.RESISTOR	18k 1/16W
R719	NRSA63F-101X-T	M.G.RESISTOR	100 1/16W
R720	NRSA63F-101X-T	M.G.RESISTOR	100 1/16W
R721	NRSA63F-103X-T	M.G.RESISTOR	10k 1/16W
R802	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R804	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R806	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R807	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R809	NRSA63F-332X-T	M.G.RESISTOR	3.3k 1/16W
R810	NRSA63F-332X-T	M.G.RESISTOR	3.3k 1/16W
R811	NRSA63F-332X-T	M.G.RESISTOR	3.3k 1/16W
R812	NRSA63F-391X-T	M.G.RESISTOR	390 1/16W
R813	NRSA63F-561X-T	M.G.RESISTOR	560 1/16W
R814	NRSA63F-391X-T	M.G.RESISTOR	390 1/16W
R815	NRSA63F-561X-T	M.G.RESISTOR	560 1/16W
R816	NRSA63F-391X-T	M.G.RESISTOR	390 1/16W
R817	NRSA63F-561X-T	M.G.RESISTOR	560 1/16W
R819	NRSA63F-221X-T	M.G.RESISTOR	220 1/16W
R821	NRSA63F-332X-T	M.G.RESISTOR	3.3k 1/16W
R822	NRSA63F-750X-T	M.G.RESISTOR	75 1/16W
R824	NRSA63F-221X-T	M.G.RESISTOR	220 1/16W

Symbol No.	Part No.	Part Name	Description
R826	NRSA63F-332X-T	M.G.RESISTOR	3.3k 1/16W
R827	NRSA63F-101X-T	M.G.RESISTOR	100 1/16W
R829	NRSA63F-221X-T	M.G.RESISTOR	220 1/16W
R831	NRSA63F-332X-T	M.G.RESISTOR	3.3k 1/16W
R832	NRSA63F-101X-T	M.G.RESISTOR	100 1/16W
R833	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R834	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R835	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R836	NRSA63F-221X-T	M.G.RESISTOR	220 1/16W
R837	NRSA63F-221X-T	M.G.RESISTOR	220 1/16W
R838	NRSA63F-221X-T	M.G.RESISTOR	220 1/16W
C1	NBE41CM-106X	TAN.CAPACITOR	10 16V
C2	NBE41CM-106X	TAN.CAPACITOR	10 16V
C3	NBE41CM-106X	TAN.CAPACITOR	10 16V
C101	NBE21CM-475X	TAN.CAPACITOR	4.7 16V
C102	NBE21CM-475X	TAN.CAPACITOR	4.7 16V
C103	NDC31HJ-2R0X	CER.CAPACITOR	2p 50V
C104	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C105	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C106	NBE21CM-475X	TAN.CAPACITOR	4.7 16V
C107	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C108	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C109	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C111	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C113	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C114	NDC31HJ-221X	CER.CAPACITOR	220p 50V
C118	NBE51AM-476X	TAN.CAPACITOR	47 10V
C119	NBE51AM-476X	TAN.CAPACITOR	47 10V
C201	NBE21CM-475X	TAN.CAPACITOR	4.7 16V
C202	NBE21CM-475X	TAN.CAPACITOR	4.7 16V
C203	NDC31HJ-2R0X	CER.CAPACITOR	2p 50V
C204	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C205	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C206	NBE21CM-475X	TAN.CAPACITOR	4.7 16V
C207	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C208	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C209	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C211	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C213	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C214	NDC31HJ-221X	CER.CAPACITOR	220p 50V
C218	NBE51AM-476X	TAN.CAPACITOR	47 10V
C219	NBE51AM-476X	TAN.CAPACITOR	47 10V
C301	NBE21CM-475X	TAN.CAPACITOR	4.7 16V
C302	NBE21CM-475X	TAN.CAPACITOR	4.7 16V
C303	NDC31HJ-2R0X	CER.CAPACITOR	2p 50V
C304	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C305	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C306	NBE21CM-475X	TAN.CAPACITOR	4.7 16V
C307	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C308	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C309	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C311	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C313	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C314	NDC31HJ-221X	CER.CAPACITOR	220p 50V
C315	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C317	NCB31CK-473X	CER.CAPACITOR	0.047 16V
C318	NBE51AM-476X	TAN.CAPACITOR	47 10V
C319	NBE51AM-476X	TAN.CAPACITOR	47 10V

[DPR1]

Symbol No.	Part No.	Part Name	Description	
C401	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C402	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C403	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C404	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C405	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C406	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C407	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C408	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C409	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C410	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C411	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C412	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C413	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C414	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C415	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C416	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C417	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C418	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C419	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C420	NDC31HJ-102X	CER.CAPACITOR	1000p	50V
C421	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C422	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C423	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C424	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C501	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C502	NDC31HJ-221X	CER.CAPACITOR	220p	50V
C503	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C504	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C505	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C506	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C507	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C508	NDC31HJ-100X	CER.CAPACITOR	10p	50V
C509	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C510	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C511	NDC31HJ-100X	CER.CAPACITOR	10p	50V
C512	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C513	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C514	NDC31HJ-100X	CER.CAPACITOR	10p	50V
C601	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C602	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C603	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C604	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C605	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C606	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C607	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C608	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C609	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C610	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C611	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C612	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C613	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C614	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C615	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C616	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C617	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C618	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C619	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C620	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C621	NCB31CK-473X	CER.CAPACITOR	0.047	16V

Symbol No.	Part No.	Part Name	Description	
C622	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C623	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C624	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C625	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C701	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C702	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C703	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C704	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C705	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C706	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C707	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C709	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C710	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C711	NDC31HJ-102X	CER.CAPACITOR	1000p	50V
C712	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C713	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C714	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C715	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C716	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C717	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C801	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C802	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C803	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C804	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C805	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C806	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C807	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C808	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C809	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C810	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C811	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C812	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C813	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C814	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C815	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C816	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C817	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C818	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C819	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C820	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C821	NDC31HJ-220X	CER.CAPACITOR	22P	50V
C822	NDC31HJ-220X	CER.CAPACITOR	22P	50V
C823	NDC31HJ-220X	CER.CAPACITOR	22P	50V
LC101	SCV2824-001W	LC FILTER	10MHz	
LC201	SCV2824-001W	LC FILTER	10MHz	
LC301	SCV2824-001W	LC FILTER	10MHz	
CN1	SCV1770-006	CONNECTOR	6PIN	
CN22	SCV2809-050	CONNECTOR	50PIN	
CN23	SCV2809-050	CONNECTOR	50PIN	
CN25	SCV1770-009	CONNECTOR	9PIN	
CN33	SCV1770-003	CONNECTOR	3PIN	
CN100	SCV2810-050	CONNECTOR	50PIN	
CN101	SCV2810-050	CONNECTOR	50PIN	
TP1 – TP503	SCV1880-001	TEST POINT		
K1 – K802	SCV2662-027	FERRITE BEADS		

5.7 DPR2 BOARD ASSEMBLY LIST 0 9
SCK2480-02-00A

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Symbol No.	Part No.	Part Name	Description
R77	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R78	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R79	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R80	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R81	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R82	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R83	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R84	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R85	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R86	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R87	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R88	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R89	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R90	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R91	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R92	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R93	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R94	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R95	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R96	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R97	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R98	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R99	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
R100	NRSA63J-223X	M.G.RESISTOR	22k 1/16W
C1	NBE41CM-106X	TAN.CAPACITOR	10 16V
C8	NBE41CM-106X	TAN.CAPACITOR	10 16V
CN29,30	SCV0501-001	CONNECTOR	50PIN

5.8 P-LD BOARD ASSEMBLY LIST 1 0
SCK2483-08-N0A
SCK2483-08-P0A

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Symbol No.	Part No.	Part Name	Description
IC1	PL5016-15-003-2	I.C.(M)	ALTERA
IC2	PLSC1169	I.C.(M)	XC17256D-PD8C (U)
	PLSC1177	I.C.(M)	XC17256D-PD8C (E)
IC3	PLSC1170	I.C.(M)	XC17256D-PD8C (U)
	PLSC1178	I.C.(M)	XC17256D-PD8C (E)
IC4	S-8052ANB-NE-X	I.C.(M)	SEIKO
IC5	TC7SU04F-X	I.C.(M)	TOSHIBA
IC6	TC7S00F-X	I.C.(M)	TOSHIBA
IC7	TC74HC125AF-X	I.C.(M)	TOSHIBA
SK2	SCV1205-008	IC SOCKET	for IC2
SK3	SCV1205-008	IC SOCKET	for IC3
Q1	DTC124EUA-X	TRANSISTOR	ROHM
D1	MA142A-X	DIODE	MATSUSHITA
R1	NRSA02J-105X	M.G.RESISTOR	1M 1/10W
R2	NRSA02J-332X	M.G.RESISTOR	3.3k 1/10W
R3	NRSA02J-103X	M.G.RESISTOR	10k 1/10W
R5	NRSA02J-100X	M.G.RESISTOR	10 1/10W
R6	NRSA02J-100X	M.G.RESISTOR	10 1/10W
R7	NRSA02J-101X	M.G.RESISTOR	100 1/10W
R8	NRSA02J-103X	M.G.RESISTOR	10k 1/10W
R10	NRSA02J-103X	M.G.RESISTOR	10k 1/10W
R11	NRSA02J-562X	M.G.RESISTOR	5.6k 1/10W
C1	NDC21HJ-330X	CER.CAPACITOR	33p 50V
C2	NDC21HJ-330X	CER.CAPACITOR	33p 50V
C3	NCB21HK-473X	CER.CAPACITOR	0.047 50V
C4	NCB21HK-473X	CER.CAPACITOR	0.047 50V
C5	NCB21HK-473X	CER.CAPACITOR	0.047 50V
C6	NCB21HK-473X	CER.CAPACITOR	0.047 50V
C7	NCB21HK-473X	CER.CAPACITOR	0.047 50V
C8	NCB21HK-473X	CER.CAPACITOR	0.047 50V
C9	QER61CM-476Z	E.CAPACITOR	47 16V
C10	QER61CM-106Z	E.CAPACITOR	10 16V
C11	NCB21HK-473X	CER.CAPACITOR	0.047 50V
LC1	EXC-EMT271BT	LC FILTER	MURATA
X1	SCV1492-001	CRYSTAL	7MHz
CN25	SCV1978-S09	CONNECTOR	9PIN

5.9 SE BOARD ASSEMBLY LIST 1 1
SCK2480-01-N0A
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Symbol No.	Part No.	Part Name	Description
IC1	JCS0027	I.C.(M)	JVC
IC2	MB88345PF	I.C.(M)	FUJITSU
IC3	TC7W08F-X	I.C.(M)	TOSHIBA
IC4	TC7W08F-X	I.C.(M)	TOSHIBA
IC5	TC7W08F-X	I.C.(M)	TOSHIBA
IC6	TC7SU04F-X	I.C.(M)	TOSHIBA
IC7	TC7S14F-X	I.C.(M)	TOSHIBA
IC8	TC7SU04F-X	I.C.(M)	TOSHIBA
IC15	TC4W53F-X	I.C.(M)	TOSHIBA
IC101	OPA658U-XE	I.C.(M)	BBJ
IC102	OPA658U-XE	I.C.(M)	BBJ
IC201	OPA658U-XE	I.C.(M)	BBJ
IC301	OPA658U-XE	I.C.(M)	BBJ
IC302	TC7S86F-X	I.C.(M)	TOSHIBA
IC401	NJM1496M-X	I.C.(M)	JRC
IC402	AD8011AR-X	I.C.(M)	ANALOG DEVICES
IC403	AD8011AR-X	I.C.(M)	ANALOG DEVICES
IC404	AD817AR-X	I.C.(M)	ANALOG DEVICES
IC405	AD8011AR-X	I.C.(M)	ANALOG DEVICES
IC406	AD817AR-X	I.C.(M)	ANALOG DEVICES
IC407	AD817AR-X	I.C.(M)	ANALOG DEVICES
IC408	TC4W53F-X	I.C.(M)	TOSHIBA
IC409	TC7W08F-X	I.C.(M)	TOSHIBA
IC410	NJM1496M-X	I.C.(M)	JRC
IC501	UPC812G2-X	I.C.(M)	NEC
IC502	TC74HC4538AFS-X	I.C.(M)	TOSHIBA
IC503	LM1881M-X	I.C.(M)	NATIONAL SEMICO
IC504	AD8011AR-X	I.C.(M)	ANALOG DEVICES
IC505	TC4W53F-X	I.C.(M)	TOSHIBA
IC601	TC7SU04F-X	I.C.(M)	TOSHIBA
IC602	TC7SU04F-X	I.C.(M)	TOSHIBA
IC603	TC4W53F-X	I.C.(M)	TOSHIBA
Q1	2SA1532/BC/-X	TRANSISTOR	MATSUSHITA
Q2	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q3	2SA1532/BC/-X	TRANSISTOR	MATSUSHITA
Q4	DTA124EUA-X	TRANSISTOR	ROHM
Q5	DTC124EUA-X	TRANSISTOR	ROHM
Q6	2SA1532/BC/-X	TRANSISTOR	MATSUSHITA
Q10	2SA1532/BC/-X	TRANSISTOR	MATSUSHITA
Q11	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q13	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q14	2SK663/QR/-X	FET	MATSUSHITA
Q15	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q16	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q23	2SA1532/BC/-X	TRANSISTOR	MATSUSHITA
Q24	2SA1532/BC/-X	TRANSISTOR	MATSUSHITA
Q25	2SA1532/BC/-X	TRANSISTOR	MATSUSHITA
Q101	2SK663/QR/-X	FET	MATSUSHITA
Q103	2SK663/QR/-X	FET	MATSUSHITA
Q104	2SA1532/BC/-X	TRANSISTOR	MATSUSHITA
Q105	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q106	2SK663/QR/-X	FET	MATSUSHITA
Q201	2SK663/QR/-X	FET	MATSUSHITA
Q202	2SK663/QR/-X	FET	MATSUSHITA
Q203	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q204	2SA1532/BC/-X	TRANSISTOR	MATSUSHITA
Q205	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q206	2SJ364/QR/-X	FET	MATSUSHITA

Symbol No.	Part No.	Part Name	Description
Q207	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q301	2SK663/QR/-X	FET	MATSUSHITA
Q302	2SK663/QR/-X	FET	MATSUSHITA
Q303	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q304	2SA1532/BC/-X	TRANSISTOR	MATSUSHITA
Q305	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q306	2SJ364/QR/-X	FET	MATSUSHITA
Q307	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q402	2SK663/QR/-X	FET	MATSUSHITA
Q403	3SK157/4-6/-W	FET	NEC
Q404	2SA1532/BC/-X	TRANSISTOR	MATSUSHITA
Q405	3SK157/4-6/-W	FET	NEC
Q407	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q501	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q502	2SA1532/BC/-X	TRANSISTOR	MATSUSHITA
D1	MA742-X	DIODE	MATSUSHITA
D8	MA143A-X	DIODE	MATSUSHITA
D401	SVC341/L/-X	VARI CAP DIODE	SANYO
D402	MA143A-X	DIODE	MATSUSHITA
D403	MA143A-X	DIODE	MATSUSHITA
D404	MA143A-X	DIODE	MATSUSHITA
D601	MA335-X	DIODE	MATSUSHITA
D602	MA335-X	DIODE	MATSUSHITA
D603	MA335-X	DIODE	MATSUSHITA
D604	MA335-X	DIODE	MATSUSHITA
R2	NRSA63F-221X-T	M.G.RESISTOR	220 1/16W
R3	NRSA63F-221X-T	M.G.RESISTOR	220 1/16W
R5	NRSA63F-153X-T	M.G.RESISTOR	15k 1/16W
R6	NRSA63F-333X-T	M.G.RESISTOR	33k 1/16W
R7	NRSA63J-105X	M.G.RESISTOR	1M 1/16W(U)
	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W(E)
R8	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W(U)
	NRSA63J-105X	M.G.RESISTOR	1M 1/16W(E)
R9	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W
R11	NRSA63F-102X-T	M.G.RESISTOR	1k 1/16W
R12	NRSA63F-821X-T	M.G.RESISTOR	820 1/16W
R13	NRSA63F-821X-T	M.G.RESISTOR	820 1/16W
R14	NRSA63F-472X-T	M.G.RESISTOR	4.7k 1/16W
R15	NRSA63F-181X-T	M.G.RESISTOR	180 1/16W
R16	NRSA63F-272X-T	M.G.RESISTOR	2.7k 1/16W
R17	NRSA63F-223X-T	M.G.RESISTOR	22k 1/16W
R18	NRSA63F-153X-T	M.G.RESISTOR	15k 1/16W
R19	NRSA63F-153X-T	M.G.RESISTOR	15k 1/16W
R20	NRSA63F-823X-T	M.G.RESISTOR	82k 1/16W
R21	NRSA63F-823X-T	M.G.RESISTOR	82k 1/16W
R22	NRSA63F-823X-T	M.G.RESISTOR	82k 1/16W
R23	NRSA63F-823X-T	M.G.RESISTOR	82k 1/16W
R24	NRSA63F-823X-T	M.G.RESISTOR	82k 1/16W
R25	NRSA63F-823X-T	M.G.RESISTOR	82k 1/16W
R26	NRSA63F-823X-T	M.G.RESISTOR	82k 1/16W
R27	NRSA63F-273X-T	M.G.RESISTOR	27k 1/16W
R28	NRSA63F-273X-T	M.G.RESISTOR	27k 1/16W
R30	NRSA63F-473X-T	M.G.RESISTOR	47k 1/16W
R33	NRSA63F-473X-T	M.G.RESISTOR	47k 1/16W
R36	NRSA63F-223X-T	M.G.RESISTOR	22k 1/16W
R37	NRSA63F-223X-T	M.G.RESISTOR	22k 1/16W

Symbol No.	Part No.	Part Name	Description	
R38	NRSA63F-222X-T	M.G.RESISTOR	2.2k	1/16W
R39	NRSA63F-222X-T	M.G.RESISTOR	2.2k	1/16W
R40	NRSA63F-472X-T	M.G.RESISTOR	4.7k	1/16W
R41	NRSA63F-103X-T	M.G.RESISTOR	10k	1/16W
R42	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R43	NRSA63F-472X-T	M.G.RESISTOR	4.7k	1/16W
R44	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R45	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R46	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R67	NRSA63F-152X-T	M.G.RESISTOR	1.5k	1/16W
R86	NRSA63F-221X-T	M.G.RESISTOR	220	1/16W
R90	NRSA63F-184X-T	M.G.RESISTOR	180k	1/16W (E)
R91	NRSA63F-334X-T	M.G.RESISTOR	330k	1/16W (E)
R92	NRSA63F-222X-T	M.G.RESISTOR	2.2k	1/16W
R93	NRSA63F-222X-T	M.G.RESISTOR	2.2k	1/16W
R101	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R102	NRSA63F-152X-T	M.G.RESISTOR	1.5k	1/16W
R103	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R104	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R105	NRSA63F-682X-T	M.G.RESISTOR	6.8k	1/16W
R106	NRSA63F-222X-T	M.G.RESISTOR	2.2k	1/16W
R107	NRSA63F-911X-T	M.G.RESISTOR	910	1/16W
R108	NRSA63F-223X-T	M.G.RESISTOR	22k	1/16W
R109	NRSA63F-331X-T	M.G.RESISTOR	330	1/16W
R110	NRSA63F-331X-T	M.G.RESISTOR	330	1/16W
R111	NRSA63F-331X-T	M.G.RESISTOR	330	1/16W
R112	NRSA63F-331X-T	M.G.RESISTOR	330	1/16W
R113	NRSA63F-331X-T	M.G.RESISTOR	330	1/16W
R114	NRSA63F-562X-T	M.G.RESISTOR	5.6k	1/16W
R115	NRSA63F-683X-T	M.G.RESISTOR	68k	1/16W
R116	NRSA63F-222X-T	M.G.RESISTOR	2.2k	1/16W
R117	NRSA63F-183X-T	M.G.RESISTOR	18k	1/16W
R119	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R120	NRSA63F-331X-T	M.G.RESISTOR	330	1/16W
R123	NRSA63F-331X-T	M.G.RESISTOR	330	1/16W
R124	NRSA63F-331X-T	M.G.RESISTOR	330	1/16W
R125	NRSA63F-392X-T	M.G.RESISTOR	3.9k	1/16W
R126	NRSA63F-681X-T	M.G.RESISTOR	680	1/16W
R127	NRSA63F-273X-T	M.G.RESISTOR	27k	1/16W (U)
	NRSA63F-563X-T	M.G.RESISTOR	56k	1/16W (E)
R128	NRSA63F-682X-T	M.G.RESISTOR	6.8k	1/16W (U)
	NRSA63F-562X-T	M.G.RESISTOR	5.6k	1/16W (E)
R129	NRSA63F-392X-T	M.G.RESISTOR	3.9k	1/16W
R130	NRSA63F-682X-T	M.G.RESISTOR	6.8k	1/16W
R131	NRSA63F-332X-T	M.G.RESISTOR	3.3k	1/16W
R132	NRSA63F-104X-T	M.G.RESISTOR	100k	1/16W
R133	NRSA63F-471X-T	M.G.RESISTOR	470	1/16W
R134	NRSA63F-821X-T	M.G.RESISTOR	820	1/16W
R135	NRSA63F-223X-T	M.G.RESISTOR	22k	1/16W
R136	NRSA63F-153X-T	M.G.RESISTOR	15k	1/16W (U)
	NRSA63F-223X-T	M.G.RESISTOR	22k	1/16W (E)
R137	NRSA63F-682X-T	M.G.RESISTOR	6.8k	1/16W
R138	NRSA63F-222X-T	M.G.RESISTOR	2.2k	1/16W
R139	NRSA63F-270X-T	M.G.RESISTOR	27	1/16W
R140	NRSA63F-561X-T	M.G.RESISTOR	560	1/16W
R141	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R142	NRSA63F-472X-T	M.G.RESISTOR	4.7k	1/16W
R143	NRSA63F-100X-T	M.G.RESISTOR	10	1/16W
R144	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W

Symbol No.	Part No.	Part Name	Description	
R145	NRSA63F-392X-T	M.G.RESISTOR	3.9k	1/16W
R146	NRSA63F-682X-T	M.G.RESISTOR	6.8k	1/16W
R147	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R148	NRSA63F-183X-T	M.G.RESISTOR	18k	1/16W (U)
	NRSA63F-472X-T	M.G.RESISTOR	4.7k	1/16W (E)
R149	NRSA63F-153X-T	M.G.RESISTOR	15k	1/16W (U)
	NRSA63F-223X-T	M.G.RESISTOR	22k	1/16W (E)
R150	NRSA63F-331X-T	M.G.RESISTOR	330	1/16W
R151	NRSA63F-152X-T	M.G.RESISTOR	1.5k	1/16W
R152	NRSA63F-390X-T	M.G.RESISTOR	39	1/16W
R153	NRSA63F-471X-T	M.G.RESISTOR	470	1/16W
R160	NRSA63F-273X-T	M.G.RESISTOR	27k	1/16W (U)
	NRSA63F-223X-T	M.G.RESISTOR	22k	1/16W (E)
R170	NRSA63F-822X-T	M.G.RESISTOR	8.2k	1/16W
R201	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R202	NRSA63F-152X-T	M.G.RESISTOR	1.5k	1/16W
R203	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R204	NRSA63F-112X-T	M.G.RESISTOR	1.1k	1/16W
R205	NRSA63F-103X-T	M.G.RESISTOR	10k	1/16W
R207	NRSA63F-472X-T	M.G.RESISTOR	4.7k	1/16W
R208	NRSA63F-821X-T	M.G.RESISTOR	820	1/16W
R209	NRSA63F-562X-T	M.G.RESISTOR	5.6k	1/16W (U)
	NRSA63F-822X-T	M.G.RESISTOR	8.2k	1/16W (E)
R210	NRSA63F-153X-T	M.G.RESISTOR	15k	1/16W (U)
	NRSA63F-223X-T	M.G.RESISTOR	22k	1/16W (E)
R212	NRSA63F-561X-T	M.G.RESISTOR	560	1/16W
R213	NRSA63F-333X-T	M.G.RESISTOR	33k	1/16W (U)
	NRSA63F-392X-T	M.G.RESISTOR	3.9k	1/16W (E)
R214	NRSA63F-683X-T	M.G.RESISTOR	68k	1/16W
R215	NRSA63F-222X-T	M.G.RESISTOR	2.2k	1/16W
R216	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W (U)
	NRSA63F-151X-T	M.G.RESISTOR	150	1/16W (E)
R217	NRSA63F-104X-T	M.G.RESISTOR	100k	1/16W
R218	NRSA63F-222X-T	M.G.RESISTOR	2.2k	1/16W
R219	NRSA63F-222X-T	M.G.RESISTOR	2.2k	1/16W
R220	NRSA63F-472X-T	M.G.RESISTOR	4.7k	1/16W
R221	NRSA63F-331X-T	M.G.RESISTOR	330	1/16W
R222	NRSA63F-562X-T	M.G.RESISTOR	5.6k	1/16W
R223	NRSA63F-222X-T	M.G.RESISTOR	2.2k	1/16W
R224	NRSA63F-153X-T	M.G.RESISTOR	15k	1/16W (U)
	NRSA63F-183X-T	M.G.RESISTOR	18k	1/16W (E)
R225	NRSA63F-562X-T	M.G.RESISTOR	5.6k	1/16W
R226	NRSA63F-392X-T	M.G.RESISTOR	3.9k	1/16W
R227	NRSA63F-151X-T	M.G.RESISTOR	150	1/16W (U)
	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W (E)
R229	NRSA63F-332X-T	M.G.RESISTOR	3.3k	1/16W
R231	NRSA63F-123X-T	M.G.RESISTOR	12k	1/16W
R301	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R302	NRSA63F-152X-T	M.G.RESISTOR	1.5k	1/16W
R303	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R304	NRSA63F-112X-T	M.G.RESISTOR	1.1k	1/16W
R305	NRSA63F-103X-T	M.G.RESISTOR	10k	1/16W
R307	NRSA63F-472X-T	M.G.RESISTOR	4.7k	1/16W
R308	NRSA63F-562X-T	M.G.RESISTOR	5.6k	1/16W (U)
	NRSA63F-822X-T	M.G.RESISTOR	8.2k	1/16W (E)
R309	NRSA63F-821X-T	M.G.RESISTOR	820	1/16W
R310	NRSA63F-153X-T	M.G.RESISTOR	15k	1/16W (U)
	NRSA63F-223X-T	M.G.RESISTOR	22k	1/16W (E)
R312	NRSA63F-391X-T	M.G.RESISTOR	390	1/16W
R313	NRSA63F-153X-T	M.G.RESISTOR	15k	1/16W (U)

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Symbol No.	Part No.	Part Name	Description	
	NRSA63F-272X-T	M.G.RESISTOR	2.7k	1/16W(E)
R314	NRSA63F-123X-T	M.G.RESISTOR	12k	1/16W
R315	NRSA63F-222X-T	M.G.RESISTOR	2.2k	1/16W
R316	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W(U)
	NRSA63F-151X-T	M.G.RESISTOR	150	1/16W(E)
R317	NRSA63F-104X-T	M.G.RESISTOR	100k	1/16W
R318	NRSA63F-222X-T	M.G.RESISTOR	2.2k	1/16W
R319	NRSA63F-222X-T	M.G.RESISTOR	2.2k	1/16W
R320	NRSA63F-472X-T	M.G.RESISTOR	4.7k	1/16W
R321	NRSA63F-331X-T	M.G.RESISTOR	330	1/16W
R322	NRSA63F-562X-T	M.G.RESISTOR	5.6k	1/16W
R323	NRSA63F-222X-T	M.G.RESISTOR	2.2k	1/16W
R324	NRSA63F-223X-T	M.G.RESISTOR	22k	1/16W
R326	NRSA63F-472X-T	M.G.RESISTOR	4.7k	1/16W(E)
R327	NRSA63F-472X-T	M.G.RESISTOR	4.7k	1/16W
R328	NRSA63F-151X-T	M.G.RESISTOR	150	1/16W(U)
	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W(E)
R329	NRSA63F-332X-T	M.G.RESISTOR	3.3k	1/16W
R331	NRSA63F-123X-T	M.G.RESISTOR	12k	1/16W
R409	NRSA63F-561X-T	M.G.RESISTOR	560	1/16W
R410	NRSA63F-122X-T	M.G.RESISTOR	1.2k	1/16W
R411	NRSA63F-221X-T	M.G.RESISTOR	220	1/16W
R412	NRSA63F-122X-T	M.G.RESISTOR	1.2k	1/16W
R413	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R414	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R415	NRSA63F-104X-T	M.G.RESISTOR	100k	1/16W
R416	NRSA63F-822X-T	M.G.RESISTOR	8.2k	1/16W
R417	NRSA63F-103X-T	M.G.RESISTOR	10k	1/16W
R418	NRSA63F-104X-T	M.G.RESISTOR	100k	1/16W
R419	NRSA63F-221X-T	M.G.RESISTOR	220	1/16W
R420	NRSA63F-181X-T	M.G.RESISTOR	180	1/16W
R421	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
R422	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R423	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R424	NRSA63F-100X-T	M.G.RESISTOR	10	1/16W
R425	NRSA63F-100X-T	M.G.RESISTOR	10	1/16W
R426	NRSA63F-331X-T	M.G.RESISTOR	330	1/16W
R427	NRSA63F-153X-T	M.G.RESISTOR	15k	1/16W(U)
	NRSA63F-223X-T	M.G.RESISTOR	2.2k	1/16W(E)
R428	NRSA63F-122X-T	M.G.RESISTOR	1.2k	1/16W
R430	NRSA63F-153X-T	M.G.RESISTOR	15k	1/16W(U)
	NRSA63F-223X-T	M.G.RESISTOR	22k	1/16W(E)
R431	NRSA63F-822X-T	M.G.RESISTOR	8.2k	1/16W(U)
	NRSA63F-153X-T	M.G.RESISTOR	15k	1/16W(E)
R432	NRSA63F-182X-T	M.G.RESISTOR	1.8k	1/16W
R433	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W(U)
	NRSA63F-821X-T	M.G.RESISTOR	820	1/16W(E)
R434	NRSA63F-472X-T	M.G.RESISTOR	4.7k	1/16W
R435	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R436	NRSA63F-272X-T	M.G.RESISTOR	2.7k	1/16W
R437	NRSA63F-750X-T	M.G.RESISTOR	75	1/16W
R438	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R439	NRSA63F-472X-T	M.G.RESISTOR	4.7k	1/16W
R440	NRSA63F-472X-T	M.G.RESISTOR	4.7k	1/16W
R441	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
R442	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R443	NRSA63F-332X-T	M.G.RESISTOR	3.3k	1/16W
R444	NRSA63F-473X-T	M.G.RESISTOR	47k	1/16W
R445	NRSA63F-560X-T	M.G.RESISTOR	56	1/16W

Symbol No.	Part No.	Part Name	Description	
R450	NRSA63F-122X-T	M.G.RESISTOR	1.2k	1/16W
R451	NRSA63F-153X-T	M.G.RESISTOR	15k	1/16W
R452	NRSA63F-272X-T	M.G.RESISTOR	2.7k	1/16W
R453	NRSA63F-152X-T	M.G.RESISTOR	1.5k	1/16W
R454	NRSA63F-392X-T	M.G.RESISTOR	3.9k	1/16W
R455	NRSA63F-152X-T	M.G.RESISTOR	1.5k	1/16W
R456	NRSA63F-392X-T	M.G.RESISTOR	3.9k	1/16W
R457	NRSA63F-472X-T	M.G.RESISTOR	4.7k	1/16W
R458	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R459	NRSA63F-333X-T	M.G.RESISTOR	33k	1/16W
R460	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
R461	NRSA63F-392X-T	M.G.RESISTOR	3.9k	1/16W
R462	NRSA63F-272X-T	M.G.RESISTOR	2.7k	1/16W
R463	NRSA63F-152X-T	M.G.RESISTOR	1.5k	1/16W
R464	NRSA63F-392X-T	M.G.RESISTOR	3.9k	1/16W
R465	NRSA63F-152X-T	M.G.RESISTOR	1.5k	1/16W
R466	NRSA63F-392X-T	M.G.RESISTOR	3.9k	1/16W
R467	NRSA63F-472X-T	M.G.RESISTOR	4.7k	1/16W
R468	NRSA63F-222X-T	M.G.RESISTOR	2.2k	1/16W
R469	NRSA63F-333X-T	M.G.RESISTOR	33k	1/16W
R470	NRSA63F-393X-T	M.G.RESISTOR	39k	1/16W(U)
	NRSA63F-393X-T	M.G.RESISTOR	39k	1/16W(E)
R471	NRSA63F-223X-T	M.G.RESISTOR	22k	1/16W
R472	NRSA63F-222X-T	M.G.RESISTOR	2.2k	1/16W
R473	NRSA63F-222X-T	M.G.RESISTOR	2.2k	1/16W
R474	NRSA63F-684X-T	M.G.RESISTOR	680k	1/16W
R475	NRSA63F-684X-T	M.G.RESISTOR	680k	1/16W
R476	NRSA63F-151X-T	M.G.RESISTOR	150	1/16W
R477	NRSA63F-561X-T	M.G.RESISTOR	560	1/16W
R478	NRSA63F-561X-T	M.G.RESISTOR	560	1/16W
R501	NRSA63F-222X-T	M.G.RESISTOR	2.2k	1/16W
R502	NRSA63F-563X-T	M.G.RESISTOR	56k	1/16W
R503	NRSA63F-273X-T	M.G.RESISTOR	27k	1/16W
R504	NRSA63F-333X-T	M.G.RESISTOR	33k	1/16W
R505	NRSA63F-273X-T	M.G.RESISTOR	27k	1/16W
R506	NRSA63F-104X-T	M.G.RESISTOR	100k	1/16W
R507	NRSA63F-122X-T	M.G.RESISTOR	1.2k	1/16W
R508	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W
R509	NRSA63F-222X-T	M.G.RESISTOR	2.2k	1/16W
R510	NRSA63F-391X-T	M.G.RESISTOR	390	1/16W
R511	NRSA63F-682X-T	M.G.RESISTOR	6.8k	1/16W
R512	NRSA63F-684X-T	M.G.RESISTOR	680k	1/16W
R513	NRSA63F-223X-T	M.G.RESISTOR	22k	1/16W
R514	NRSA63F-223X-T	M.G.RESISTOR	22k	1/16W
R515	NRSA63F-104X-T	M.G.RESISTOR	100k	1/16W
R516	NRSA63F-272X-T	M.G.RESISTOR	2.7k	1/16W
R601	NRSA63F-104X-T	M.G.RESISTOR	100k	1/16W
R602	NRSA63F-103X-T	M.G.RESISTOR	10k	1/16W
R603	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
R604	NRSA63F-271X-T	M.G.RESISTOR	270	1/16W
R605	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W
R606	NRSA63F-104X-T	M.G.RESISTOR	100k	1/16W
R607	NRSA63F-104X-T	M.G.RESISTOR	100k	1/16W
R608	NRSA63F-224X-T	M.G.RESISTOR	220k	1/16W
R609	NRSA63F-124X-T	M.G.RESISTOR	120k	1/16W
R610	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
R611	NRSA63F-221X-T	M.G.RESISTOR	220	1/16W
R612	NRSA63F-271X-T	M.G.RESISTOR	270	1/16W
R613	NRSA63F-104X-T	M.G.RESISTOR	100k	1/16W
R614	NRSA63F-104X-T	M.G.RESISTOR	100k	1/16W

Symbol No.	Part No.	Part Name	Description	
R615	NRSA63F-104X-T	M.G.RESISTOR	100k	1/16W
R616	NRSA63F-333X-T	M.G.RESISTOR	33k	1/16W
R617	NRSA63F-124X-T	M.G.RESISTOR	120k	1/16W
R618	NRSA63F-224X-T	M.G.RESISTOR	220k	1/16W
R619	NRSA63F-223X-T	M.G.RESISTOR	22k	1/16W
R620	NRSA63F-223X-T	M.G.RESISTOR	22k	1/16W
R701	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W(E)
R702	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W(U)
C1	NBE21AM-106X	TAN.CAPACITOR	10	10V
C2	NBE21AM-106X	TAN.CAPACITOR	10	10V
C3	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C4	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C5	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C6	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C7	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C8	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C9	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C10	NBE21AM-106X	TAN.CAPACITOR	10	10V
C11	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C12	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C13	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C14	NDC31HJ-270X	CER.CAPACITOR	27p	50V
C15	NDC31HJ-270X	CER.CAPACITOR	27p	50V
C16	NDC31HJ-330X	CER.CAPACITOR	33p	50V
C41	NDC31HJ-150X	CER.CAPACITOR	15p	50V
C52	NDC31HJ-470X	CER.CAPACITOR	47p	50V
C53	NDC31HJ-470X	CER.CAPACITOR	47p	50V
C54	NDC31HJ-220X	CER.CAPACITOR	22p	50V
C58	NEH90JM-476X	E.CAPACITOR	47	6.3V
C59	NEH90JM-476X	E.CAPACITOR	47	6.3V
C101	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C102	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C103	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C104	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C105	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C106	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C107	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C108	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C109	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C110	NDC31HJ-680X	CER.CAPACITOR	68p	50V
C111	NDC31HJ-180X	CER.CAPACITOR	18p	50V
C201	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C202	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C203	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C204	NDC31HJ-680X	CER.CAPACITOR	68p	50V
C301	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C302	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C303	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C304	NDC31HJ-680X	CER.CAPACITOR	68p	50V
C401	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C402	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C406	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C407	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C408	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C409	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C410	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C411	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C412	NCB31CK-473X	CER.CAPACITOR	0.047	16V

Symbol No.	Part No.	Part Name	Description	
C413	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C414	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C415	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C416	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C417	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C418	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C420	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C421	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C422	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C423	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C424	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C425	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C426	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C427	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C430	NBE21VM-224X	TAN.CAPACITOR	0.22	35V
C431	NBE21VM-224X	TAN.CAPACITOR	0.22	35V
C432	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C433	NDC31HJ-220X	CER.CAPACITOR	22p	50V (U)
	NDC31HJ-150X	CER.CAPACITOR	15p	50V (E)
C434	NDC31HJ-120X	CER.CAPACITOR	12p	50V (U)
	NDC31HJ-9R0X	CER.CAPACITOR	9p	50V (E)
C435	NDC31HJ-2R0X	CER.CAPACITOR	2p	50V
C436	NDC31HJ-180X	CER.CAPACITOR	18p	50V (U)
C501	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C502	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C503	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C504	NDC31HJ-560X	CER.CAPACITOR	56p	50V
C505	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C506	NDC31HJ-151X	CER.CAPACITOR	150p	50V (U)
	NDC31HJ-121X	CER.CAPACITOR	120p	50V (E)
C508	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C509	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C510	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C511	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C512	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C513	NBE21AM-106X	TAN.CAPACITOR	10	10V
C601	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C602	NBE21EM-105X	TAN.CAPACITOR	1	25V
C603	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C604	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C605	NDC31HJ-222X	CER.CAPACITOR	2200p	50V
C606	NDC31HJ-222X	CER.CAPACITOR	2200p	50V
C607	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C608	NDC31HJ-222X	CER.CAPACITOR	2200p	50V
C609	NDC31HJ-222X	CER.CAPACITOR	2200p	50V
C610	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C611	NCB31HK-103X	CER.CAPACITOR	0.01	50V
C612	NBE21EM-105X	TAN.CAPACITOR	1	25V
C613	NDC31HJ-220X	CER.CAPACITOR	22p	50V
L501	NQL054K-120X	COIL	12μH	
LC5	SCV2031-001V	LC FILTER		
LC6	SCV2030-001W	LC FILTER		
LC101	SCV1859-001	LC FILTER	12MHz LPF	
LC201	NQR0145-001X	LC FILTER	3MHz LPF	
LC301	NQR0145-001X	LC FILTER	3MHz LPF	
LC401	SCV2637-001	LC FILTER	Fsc BPF	(U)
	SCV2638-001	LC FILTER	Fsc BPF	(E)

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Symbol No.	Part No.	Part Name	Description
LC501	SCV2597-S144Z	LC FILTER	
X601	SCV1316-002	CRYSTAL	27MHz
X602	SCV2219-001W	CRYSTAL	14.31818MHz (U)
	CE42275-001Y	CRYSTAL	17.734475MHz (E)
CN31	SCV0501-001	CONNECTOR	30PIN
CN32	SCV0501-001	CONNECTOR	30PIN
TP1 – TP10	SCV1880-001	TEST POINT	
K1 – K602	SCV2662-027	FERRITE BEADS	

5.10 CP BOARD ASSEMBLY LIST 1 2

SCK2479-00A

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Symbol No.	Part No.	Part Name	Description
IC1	MB90T678BPF	I.C.(M)	FUJITSU
IC2	PLSC1165	I.C.(M)	N28F001
SK2	SCV2768-001X	IC SOCKET	for IC2
IC3	LH5168N-10L	I.C.(M)	SHARP
IC4	MC74HC373AF-X	I.C.(M)	MOTOROLA
IC5	TC74HC00AF-X	I.C.(M)	TOSHIBA
IC6	S-8052ANB-NE-X	I.C.(M)	SEIKO
IC7	S-29230AFJ-X	I.C.(M)	SEIKO
IC8	RTC-4513A	I.C.(M)	EPSON
IC9	MB89255BH-PF	I.C.(M)	FUJITSU
IC11	JCS0005	I.C.(M)	JVC
IC12	UPD6453GT-101	I.C.(M)	NEC
IC13	AD817AR-X	I.C.(M)	ANALOG DEVICES
IC14	TC74VHC125FS-X	I.C.(M)	TOSHIBA
IC21	LMC6082IM-X	I.C.(M)	NATIONAL SEMICO
IC22	LMC6082IM-X	I.C.(M)	NATIONAL SEMICO
IC23	LMC6082IM-X	I.C.(M)	NATIONAL SEMICO
IC24	LMC6082IM-X	I.C.(M)	NATIONAL SEMICO
IC25	LMC6082IM-X	I.C.(M)	NATIONAL SEMICO
IC26	MC14066BF-X	I.C.(M)	MOTOROLA
IC27	TC4S66F-X	I.C.(M)	TOSHIBA
IC28	TC4S66F-X	I.C.(M)	TOSHIBA
IC29	TC4S66F-X	I.C.(M)	TOSHIBA
IC30	MC74HC4052F-X	I.C.(M)	MOTOROLA
IC31	NJM062M-X	I.C.(M)	JRC
IC32	NJM062M-X	I.C.(M)	JRC
IC35	MC74HC4052F-X	I.C.(M)	MOTOROLA
IC36	TC4S66F-X	I.C.(M)	TOSHIBA
IC37	NJM2068M-D-X	I.C.(M)	JRC
IC38	MC14066BF-X	I.C.(M)	MOTOROLA
IC501	TC7S08F-X	I.C.(M)	TOSHIBA
Q1	DTC124EUA-X	TRANSISTOR	ROHM
Q2	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q3	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q4	MSC3930/B/-X	TRANSISTOR	MOTOROLA
Q5	2SA1532/BC/-X	TRANSISTOR	MATSUSHITA
D1	MA142WK-X	DIODE	MATSUSHITA
D2	MA335-X	DIODE	MATSUSHITA
D3	MA742-X	DIODE	MATSUSHITA
D4	MA742-X	DIODE	MATSUSHITA
D5	MA742-X	DIODE	MATSUSHITA
D6	MA742-X	DIODE	MATSUSHITA
D9	MA742-X	DIODE	MATSUSHITA
D501	MA784-X	DIODE	MATSUSHITA
D502	MA784-X	DIODE	MATSUSHITA
D503	MA784-X	DIODE	MATSUSHITA
R1	NRSA63F-222X-T	M.G.RESISTOR	2.2k 1/16W
R2	NRSA63F-103X-T	M.G.RESISTOR	10k 1/16W
R3	NRSA63F-102X-T	M.G.RESISTOR	1k 1/16W
R4	NRSA63F-101X-T	M.G.RESISTOR	100 1/16W
R5	NRSA63F-332X-T	M.G.RESISTOR	3.3k 1/16W
R6	NRSA63F-473X-T	M.G.RESISTOR	47k 1/16W
R7	NRSA63J-0R0X	M.G.RESISTOR	0 1/16W

Symbol No.	Part No.	Part Name	Description	
R8	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R11	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R12	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R13	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R14	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R15	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R16	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R17	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R18	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R19	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R20	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R21	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R22	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R23	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R24	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R25	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R26	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R31	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R32	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R33	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R34	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R35	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R36	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R37	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R38	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R40	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R41	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R42	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R43	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R44	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R45	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R46	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R47	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R48	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R49	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R52	NRSA63F–102X–T	M.G.RESISTOR	1k	1/16W
R53	NRSA63F–103X–T	M.G.RESISTOR	10k	1/16W
R54	NRSA63F–104X–T	M.G.RESISTOR	100k	1/16W
R55	NRSA63F–104X–T	M.G.RESISTOR	100k	1/16W
R56	NRSA63F–393X–T	M.G.RESISTOR	39k	1/16W
R57	NRSA63F–393X–T	M.G.RESISTOR	39k	1/16W
R58	NRSA63F–153X–T	M.G.RESISTOR	15k	1/16W
R59	NRSA63F–103X–T	M.G.RESISTOR	10k	1/16W
R60	NRSA63F–562X–T	M.G.RESISTOR	5.6k	1/16W
R61	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R62	NRSA63F–473X–T	M.G.RESISTOR	47k	1/16W
R71	NRSA63F–103X–T	M.G.RESISTOR	10k	1/16W
R72	NRSA63F–392X–T	M.G.RESISTOR	3.9k	1/16W
R73	NRSA63F–102X–T	M.G.RESISTOR	1k	1/16W
R74	NRSA63F–103X–T	M.G.RESISTOR	10k	1/16W
R75	NRSA63F–392X–T	M.G.RESISTOR	3.9k	1/16W
R76	NRSA63F–102X–T	M.G.RESISTOR	1k	1/16W
R77	NRSA63F–103X–T	M.G.RESISTOR	10k	1/16W
R78	NRSA63F–392X–T	M.G.RESISTOR	3.9k	1/16W
R79	NRSA63F–102X–T	M.G.RESISTOR	1k	1/16W
R80	NRSA63F–564X–T	M.G.RESISTOR	560k	1/16W
R81	NRSA63F–564X–T	M.G.RESISTOR	560k	1/16W
R82	NRSA63F–564X–T	M.G.RESISTOR	560k	1/16W
R83	NRSA63F–152X–T	M.G.RESISTOR	1.5k	1/16W

Symbol No.	Part No.	Part Name	Description	
R85	NRSA63F–103X–T	M.G.RESISTOR	10k	1/16W
R91	NRSA63F–331X–T	M.G.RESISTOR	330	1/16W
R93	NRSA63F–561X–T	M.G.RESISTOR	560	1/16W
R94	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R95	NRSA63F–391X–T	M.G.RESISTOR	390	1/16W
R96	NRSA63F–561X–T	M.G.RESISTOR	560	1/16W
R97	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R98	NRSA63F–331X–T	M.G.RESISTOR	330	1/16W
R100	NRSA63F–561X–T	M.G.RESISTOR	560	1/16W
R101	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R102	NRSA63F–103X–T	M.G.RESISTOR	10k	1/16W
R103	NRSA63F–272X–T	M.G.RESISTOR	2.7k	1/16W
R104	NRSA63F–122X–T	M.G.RESISTOR	1.2k	1/16W
R105	NRSA63F–562X–T	M.G.RESISTOR	5.6k	1/16W
R106	NRSA63F–332X–T	M.G.RESISTOR	3.3k	1/16W
R107	NRSA63F–222X–T	M.G.RESISTOR	2.2k	1/16W
R108	NRSA63F–152X–T	M.G.RESISTOR	1.5k	1/16W
R109	NRSA63F–102X–T	M.G.RESISTOR	1k	1/16W
R110	NRSA63F–103X–T	M.G.RESISTOR	10k	1/16W
R111	NRSA63F–222X–T	M.G.RESISTOR	2.2k	1/16W
R112	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R120	NRSA63F–225X–T	M.G.RESISTOR	2.2M	1/16W
R121	NRSA63F–332X–T	M.G.RESISTOR	3.3k	1/16W
R122	NRSA63F–332X–T	M.G.RESISTOR	3.3k	1/16W
R123	NRSA63F–103X–T	M.G.RESISTOR	10k	1/16W
R132	NRSA63F–272X–T	M.G.RESISTOR	2.7k	1/16W
R134	NRSA63F–272X–T	M.G.RESISTOR	2.7k	1/16W
R135	NRSA63F–224X–T	M.G.RESISTOR	220k	1/16W
R136	NRSA63F–223X–T	M.G.RESISTOR	22k	1/16W
R137	NRSA63F–222X–T	M.G.RESISTOR	2.2k	1/16W
R138	NRSA63J–0R0X	M.G.RESISTOR	0	1/16W
R141	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R142	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R143	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R144	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R145	NRSA63F–100X–T	M.G.RESISTOR	10	1/16W
R146	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R147	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R148	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R149	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R150	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R151	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R152	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R153	NRSA63F–102X–T	M.G.RESISTOR	1k	1/16W
R154	NRSA63F–102X–T	M.G.RESISTOR	1k	1/16W
R155	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R156	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R157	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R158	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R159	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R160	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R161	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R162	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R163	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R164	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R165	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R166	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R167	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W
R168	NRSA63F–101X–T	M.G.RESISTOR	100	1/16W

[CP]

Symbol No.	Part No.	Part Name	Description	
R169	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W
R170	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W
R171	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W
R172	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W
R173	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W
R174	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W
R175	NRSA63F-471X-T	M.G.RESISTOR	470	1/16W
R176	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W
R177	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W
R178	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W
R179	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W
R180	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W
R181	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W
R182	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W
R183	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W
R184	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W
R185	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W
R186	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W
R187	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W
R188	NRSA63F-472X-T	M.G.RESISTOR	4.7k	1/16W
R189	NRSA63F-472X-T	M.G.RESISTOR	4.7k	1/16W
R190	NRSA63F-472X-T	M.G.RESISTOR	4.7k	1/16W
R191	NRSA63F-473X-T	M.G.RESISTOR	47k	1/16W
R192	NRSA63F-103X-T	M.G.RESISTOR	10k	1/16W
R193	NRSA63F-223X-T	M.G.RESISTOR	22k	1/16W
R194	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R501	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W
R503	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W
R504	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W
R505	NRSA63F-101X-T	M.G.RESISTOR	100	1/16W
R506	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
R507	NRSA63J-105X	M.G.RESISTOR	1M	1/16W
R509	NRSA63F-102X-T	M.G.RESISTOR	1k	1/16W
VR2	NVP1415-503X	TRIM.RESISTOR	Eoo ADJ	50k
VR3	NVP1415-201X	TRIM.RESISTOR	B.ADJ	200
VR4	NVP1415-201X	TRIM.RESISTOR	R.ADJ	200
VR5	SCV2773-103V	V RESISTOR	AU.LEVEL	10k
C1	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C2	NBE21AM-106X	TAN.CAPACITOR	10	10V
C4	NCB31HK-562X	CER.CAPACITOR	5600p	50V
C5	NBE21EM-105X	TAN.CAPACITOR	1	25V
C6	NDC31HJ-820X	CER.CAPACITOR	82p	50V
C7	NDC31HJ-150X	CER.CAPACITOR	15p	50V
C8	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C11	NDC31HJ-100X	CER.CAPACITOR	10p	50V
C12	NDC31HJ-270X	CER.CAPACITOR	27p	50V
C13	NDC31HJ-270X	CER.CAPACITOR	27p	50V
C14	NDC31HJ-270X	CER.CAPACITOR	27p	50V
C15	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C16	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C17	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C18	NFV41CJ-473X	M.M.CAPACITOR	0.047	16V
C19	NFV41CJ-473X	M.M.CAPACITOR	0.047	16V
C20	NFV41CJ-473X	M.M.CAPACITOR	0.047	16V
C21	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C22	NFV41CJ-473X	M.M.CAPACITOR	0.047	16V
C23	NFV41CJ-473X	M.M.CAPACITOR	0.047	16V

Symbol No.	Part No.	Part Name	Description	
C25	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C26	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C30	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C31	NFV41CJ-473X	M.M.CAPACITOR	0.047	16V
C32	NFV41CJ-473X	M.M.CAPACITOR	0.047	16V
C33	NFV41CJ-473X	M.M.CAPACITOR	0.047	16V
C34	NFV41CJ-473X	M.M.CAPACITOR	0.047	16V
C35	NFV41CJ-473X	M.M.CAPACITOR	0.047	16V
C36	NFV41CJ-473X	M.M.CAPACITOR	0.047	16V
C37	NFV41CJ-473X	M.M.CAPACITOR	0.047	16V
C41	NBE21AM-106X	TAN.CAPACITOR	10	10V
C42	NBE21AM-106X	TAN.CAPACITOR	10	10V
C43	NBE21AM-106X	TAN.CAPACITOR	10	10V
C44	NBE21AM-106X	TAN.CAPACITOR	10	10V
C45	NBE51AM-476X	TAN.CAPACITOR	47	10V
C46	NBE51AM-476X	TAN.CAPACITOR	47	10V
C51	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C52	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C53	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C54	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C56	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C57	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C58	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C60	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C61	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C62	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C64	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C65	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C66	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C67	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C68	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C69	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C70	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C71	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C72	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C73	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C74	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C79	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C80	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C81	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C501	NDC31HJ-100X	CER.CAPACITOR	10p	50V
C502	NCB31HK-562X	CER.CAPACITOR	5600p	50V
C503	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C504	NCB31CK-473X	CER.CAPACITOR	0.047	16V
L1	NQL054K-220X	COIL	22μH	
X1	SCV2811-001Z	CRYSTAL	4MHz	
S1	SCV2169-001	SLIDE SWITCH	DNR	
S2	SCV2169-001	SLIDE SWITCH	SHUTTER	
S3	SCV2771-001Z	TACT SWITCH	MENU	
S4	SCV2771-001Z	TACT SWITCH	ITEM	
S5	SCV2771-001Z	TACT SWITCH	SET	
S6	SCV2771-001Z	TACT SWITCH	UP	
S7	SCV2771-001Z	TACT SWITCH	DOWN	
S8	SCV2169-001	SLIDE SWITCH	FILE	
S12	SCV2595-008W	DIP SWITCH		

Symbol No.	Part No.	Part Name	Description
CN16	SCV1770-010	CONNECTOR	10PIN
CN18	SCV1770-009	CONNECTOR	9PIN
CN27	SCV2644-120X	CONNECTOR	20PIN
CN28	SCV2644-124X	CONNECTOR	24PIN
TP1 – TP18	SCV1880-001	TEST POINT	
BT1	CR2032-HLD	BATTERY HOLDER	
K1,K2	SCV2662-027	FERRITE BEADS	

5.11 IF BOARD ASSEMBLY LIST 1 3
SCK2483-01-00A

1 3 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
IC1	AD817AR-X	I.C.(M)	ANALOG DEVICES
D1	HZM6C-X	ZENER DIODE	HITACHI
D2	MA143A-X	DIODE	MATSUSHITA
D3	MA143A-X	DIODE	MATSUSHITA
D4	MA143A-X	DIODE	MATSUSHITA
D5	MA143A-X	DIODE	MATSUSHITA
D6	HZM9C-X	ZENER DIODE	HITACHI
D7	MA143A-X	DIODE	MATSUSHITA
D8	MA143A-X	DIODE	MATSUSHITA
D9	MA143A-X	DIODE	MATSUSHITA
D10	MA143A-X	DIODE	MATSUSHITA
D11	MA143A-X	DIODE	MATSUSHITA
D12	MA143A-X	DIODE	MATSUSHITA
D13	MA143A-X	DIODE	MATSUSHITA
D14	MA143A-X	DIODE	MATSUSHITA
D15	MA143A-X	DIODE	MATSUSHITA
D16	MA143A-X	DIODE	MATSUSHITA
D17	MA143A-X	DIODE	MATSUSHITA
D18	HZM6C-X	ZENER DIODE	HITACHI
D19	MA143A-X	DIODE	MATSUSHITA
D20	HZM9C-X	ZENER DIODE	HITACHI
D21	MA143A-X	DIODE	MATSUSHITA
D22	MA143A-X	DIODE	MATSUSHITA
D23	MA143A-X	DIODE	MATSUSHITA
D24	MA143A-X	DIODE	MATSUSHITA
D25	MA143A-X	DIODE	MATSUSHITA
D26	MA143A-X	DIODE	MATSUSHITA
D27	MA143A-X	DIODE	MATSUSHITA
D28	MA143A-X	DIODE	MATSUSHITA
D29	MA143A-X	DIODE	MATSUSHITA
D30	MA143A-X	DIODE	MATSUSHITA
D31	MA143A-X	DIODE	MATSUSHITA
D32	MA143A-X	DIODE	MATSUSHITA
R1	NRSA02J-153X	M.G.RESISTOR	15k 1/10W
R2	NRSA02J-473X	M.G.RESISTOR	47k 1/10W
R3	NRSA02J-153X	M.G.RESISTOR	15k 1/10W
R4	NRSA02J-473X	M.G.RESISTOR	47k 1/10W
R5	NRSA02J-562X	M.G.RESISTOR	5.6k 1/10W
R6	NRSA02J-101X	M.G.RESISTOR	100 1/10W
R7	NRSA02J-562X	M.G.RESISTOR	5.6k 1/10W
R8	NRSA02J-750X	M.G.RESISTOR	75 1/10W
R9	NRSA02J-682X	M.G.RESISTOR	6.8k 1/10W
R10	NRSA02J-102X	M.G.RESISTOR	1k 1/10W
R11	NRSA02J-473X	M.G.RESISTOR	47k 1/10W
R12	NRSA02J-473X	M.G.RESISTOR	47k 1/10W
R13	NRSA02J-0R0X	M.G.RESISTOR	0 1/10W
C1	NCB21HK-473X	CER.CAPACITOR	0.047 50V
⚠ LC1	EXC-EMT271BT	LC FILTER	MURATA
CN11	SSV1591-L03	CONNECTOR	3PIN
CN34	SCV2447-026	CONNECTOR	26PIN
CN35	SCV2447-020	CONNECTOR	20PIN
⚠ CN39	SCV1259-50P	CONNECTOR	50PIN
CN43	SCV1978-L05	CONNECTOR	5PIN
K1-K3	SCV2662-027	FERRITE BEADS	

5.12 SW1 BOARD ASSEMBLY LIST 1 4

SCK2483-02-00A 1 4 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
S7	SCV0516-A18JB2	TOGGLE SWITCH	ACCU FOCUS/WHT
S8	SCV1639-001	PUSH SWITCH	VTR TRIG1
S9	SCV0337-002	TOGGLE SWITCH	ZEBRA
CN15	SCV1978-L05	CONNECTOR	5PIN

5.13 SW2 BOARD ASSEMBLY LIST 1 5

SCK2483-03-00A 1 5 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
Q1	2SK662/QR/-X	FET	MATSUSHITA
LD1	SLB-25VR3F	LED	
R1	NRSA02J-332X	M.G.RESISTOR	3.3k 1/10W
R2	NRSA02J-152X	M.G.RESISTOR	1.5k 1/10W
R3	NRSA02J-473X	M.G.RESISTOR	47k 1/10W
R4	NRSA02J-564X	M.G.RESISTOR	560k 1/10W
⚠ S1	SCV1313-001	TOGGLE SWITCH	POWER
	SC43656-185	SPACER	
CN11	SSV1591-L03	CONNECTOR	3PIN
CN17	SSV1591-L05	CONNECTOR	5PIN

5.14 SW3 BOARD ASSEMBLY LIST 1 6

SCK2483-04-00A 1 6 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
S2	SCV1639-001	PUSH SWITCH	VTR TRIG2
CN38	SCV1978-L02	CONNECTOR	2PIN

5.15 SW4 BOARD ASSEMBLY LIST 1 7

SCK2483-05-00A 1 7 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
D1	HZM6C-X	ZENER DIODE	HITACHI
D2	HZM6C-X	ZENER DIODE	HITACHI
D3	HZM6C-X	ZENER DIODE	HITACHI
D4	HZM6C-X	ZENER DIODE	HITACHI
D5	HZM6C-X	ZENER DIODE	HITACHI
D6	HZM6C-X	ZENER DIODE	HITACHI
D7	HZM6C-X	ZENER DIODE	HITACHI
S3	SCV0516-A13HB2	TOGGLE SWITCH	GAIN
S4	SCV0516-A18JB2	TOGGLE SWITCH	DISPLAY
S5	SCV0337-002	TOGGLE SWITCH	MODE
S6	SCV0338-002	TOGGLE SWITCH	WHITE BAL
CN16	SCV1978-L10	CONNECTOR	10PIN
CN38	SCV1978-L02	CONNECTOR	2PIN

5.16 SW5 BOARD ASSEMBLY LIST 1 8

SCK2483-06-00A 1 8 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
LD2	GL3HS44	L.E.D.	SHARP
	SC43656-050	LED SPACER	
S10	SCV1639-001	PUSH SWITCH	FAS
S11	SCV1639-001	PUSH SWITCH	LOLUX
S12	SCV2729-001	SLIDE SWITCH	IRIS
S13	SCV2729-001	SLIDE SWITCH	BLACK
CN18	SCV1978-L09	CONNECTOR	9PIN

5.17 SW6 BOARD ASSEMBLY LIST 1 9

SCK2483-07-U0A 1 9 ☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description
R1	NRSA02J-0R0X	M.G.RESISTOR	0 1/10W
R2	NRSA02J-0R0X	M.G.RESISTOR	0 1/10W
R3	NRSA02J-223X	M.G.RESISTOR	22k 1/10W
R4	NRSA02J-562X	M.G.RESISTOR	5.6k 1/10W
R5	NRSA02J-103X	M.G.RESISTOR	10k 1/10W
R6	NRSA02J-183X	M.G.RESISTOR	18k 1/10W
R7	NRSA02J-223X	M.G.RESISTOR	22k 1/10W
R8	NRSA02J-332X	M.G.RESISTOR	3.3k 1/10W
VR1	QVPB609-203Z	TRIM.RESISTOR	H PHASE 20k
VR2	QVPB609-203Z	TRIM.RESISTOR	SC PHASE 20k
S14	SCV1682-001	ROTARY SWICH	SC COARSE
S15	SCV2578-001	SLIDE SWITCH	DISP MIX
S16	QSW0459-001	SLIDE SWITCH	PHANTOM
CN12	SCV2447-010	CONNECTOR	10PIN

5.18 CN BOARD ASSEMBLY LIST 2 0

SCK2483-09-00A 2 0 ☐☐☐☐☐☐

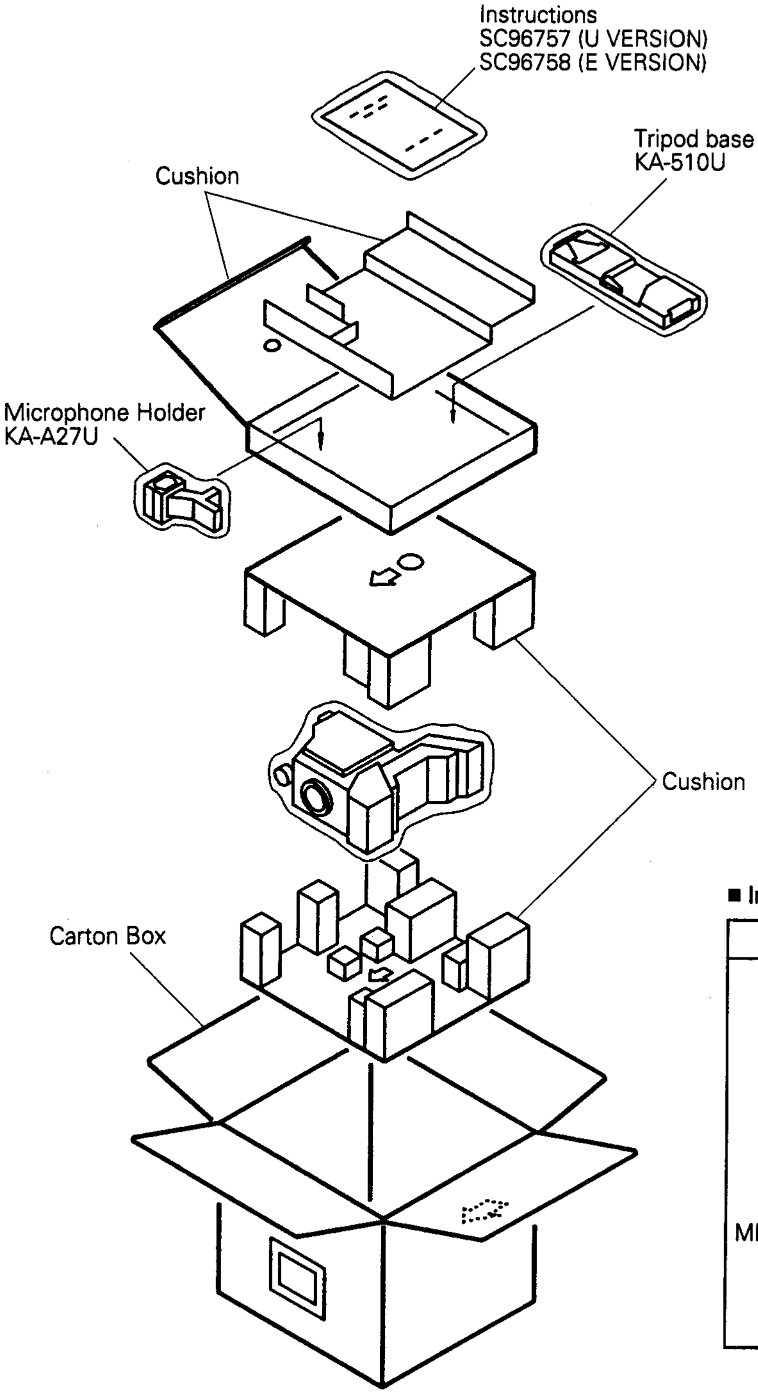
Symbol No.	Part No.	Part Name	Description
CN37	SCV1978-S05	CONNECTOR	5PIN

5.19 AU BOARD ASSEMBLY LIST $\boxed{2}\boxed{1}$

SCK2477-07-U0A $\boxed{2}\boxed{1}$☐☐☐☐☐☐

Symbol No.	Part No.	Part Name	Description	
IC1	NJM2068M-D-X	I.C.(M)	JRC	
IC2	M5222FP-XE	I.C.(M)	MITSUBISHI	
IC3	NJM2068M-D-X	I.C.(M)	JRC	
IC4	NJM2068M-D-X	I.C.(M)	JRC	
IC5	TC74HC165AF-X	I.C.(M)	TOSHIBA	
Q1	2SD1820/QR/-X	TRANSISTOR	MATSUSHITA	
Q2	2SB766/QR/-X	TRANSISTOR	MATSUSHITA	
D1	MA143A-X	DIODE	MATSUSHITA	
D2	MA143A-X	DIODE	MATSUSHITA	
D3	MA143A-X	DIODE	MATSUSHITA	
D4	MA143A-X	DIODE	MATSUSHITA	
D5	MA143A-X	DIODE	MATSUSHITA	
D6	MA143A-X	DIODE	MATSUSHITA	
D7	MA143A-X	DIODE	MATSUSHITA	
D8	MA143A-X	DIODE	MATSUSHITA	
D9	MA143A-X	DIODE	MATSUSHITA	
D10	MA143A-X	DIODE	MATSUSHITA	
D11	MA143A-X	DIODE	MATSUSHITA	
D12	MA143A-X	DIODE	MATSUSHITA	
D13	MA143A-X	DIODE	MATSUSHITA	
D14	MA143A-X	DIODE	MATSUSHITA	
R1	NRSA63J-182X	M.G.RESISTOR	1.8k	1/16W
R2	NRSA63J-182X	M.G.RESISTOR	1.8k	1/16W
R3	NRSA63J-182X	M.G.RESISTOR	1.8k	1/16W
R4	NRSA63J-182X	M.G.RESISTOR	1.8k	1/16W
R5	NRSA63J-182X	M.G.RESISTOR	1.8k	1/16W
R6	NRSA63J-182X	M.G.RESISTOR	1.8k	1/16W
R7	NRSA63J-182X	M.G.RESISTOR	1.8k	1/16W
R8	NRSA63J-182X	M.G.RESISTOR	1.8k	1/16W
R9	NRSA63J-220X	M.G.RESISTOR	22	1/16W
R10	NRSA63J-821X	M.G.RESISTOR	820	1/16W
R11	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R12	NRSA63J-473X	M.G.RESISTOR	47k	1/16W
R13	NRSA63J-273X	M.G.RESISTOR	27k	1/16W
R14	NRSA63J-220X	M.G.RESISTOR	22	1/16W
R15	NRSA63J-821X	M.G.RESISTOR	820	1/16W
R16	NRSA63J-102X	M.G.RESISTOR	1k	1/16W
R17	NRSA63J-473X	M.G.RESISTOR	47k	1/16W
R18	NRSA63J-273X	M.G.RESISTOR	27k	1/16W
R19	NRSA63J-822X	M.G.RESISTOR	8.2k	1/16W
R20	NRSA63J-125X	M.G.RESISTOR	1.2M	1/16W
R21	NRSA63J-564X	M.G.RESISTOR	560k	1/16W
R22	NRSA63J-124X	M.G.RESISTOR	120k	1/16W
R23	NRSA63J-124X	M.G.RESISTOR	120k	1/16W
R24	NRSA63J-124X	M.G.RESISTOR	120k	1/16W
R25	NRSA63J-273X	M.G.RESISTOR	27k	1/16W
R26	NRSA63J-393X	M.G.RESISTOR	39k	1/16W
R27	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R28	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R29	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R30	NRSA63J-470X	M.G.RESISTOR	47	1/16W
R31	NRSA63J-124X	M.G.RESISTOR	120k	1/16W
R32	NRSA63J-273X	M.G.RESISTOR	27k	1/16W
R33	NRSA63J-393X	M.G.RESISTOR	39k	1/16W
R34	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R35	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R36	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R37	NRSA63J-470X	M.G.RESISTOR	47	1/16W
R41	NRSA63J-0R0X	M.G.RESISTOR	0	1/16W
R43	NRSA63J-123X	M.G.RESISTOR	12k	1/16W
R44	NRSA63J-821X	M.G.RESISTOR	820	1/16W
R45	NRSA63J-153X	M.G.RESISTOR	15k	1/16W
R46	NRSA63J-222X	M.G.RESISTOR	2.2k	1/16W
R47	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R48	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R49	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R50	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R51	NRSA63J-334X	M.G.RESISTOR	330k	1/16W
R52	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
R53	NRSA63J-223X	M.G.RESISTOR	22k	1/16W
C1	NEH91HM-335NZ	E.CAPACITOR	3.3	50V
C2	NDC31HJ-331X	CER.CAPACITOR	330p	50V
C3	NDC31HJ-151X	CER.CAPACITOR	150p	50V
C4	NEH91HM-335NZ	E.CAPACITOR	3.3	50V
C5	NDC31HJ-331X	CER.CAPACITOR	330p	50V
C6	NDC31HJ-151X	CER.CAPACITOR	150p	50V
C7	NBE71CM-476X	TAN.CAPACITOR	47	16V
C8	NBE71CM-476X	TAN.CAPACITOR	47	16V
C9	NBE21AM-106X	TAN.CAPACITOR	10	10V
C10	NEN21EM-335X	N.P.CAPACITOR	3.3	25V
C11	NDC31HJ-101X	CER.CAPACITOR	100p	50V
C12	NDC31HJ-101X	CER.CAPACITOR	100p	50V
C13	NEN21EM-335X	N.P.CAPACITOR	3.3	25V
C14	NDC31HJ-101X	CER.CAPACITOR	100p	50V
C15	NDC31HJ-101X	CER.CAPACITOR	100p	50V
C16	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C17	NEN21EM-335X	N.P.CAPACITOR	3.3	25V
C18	NBE21CM-475X	TAN.CAPACITOR	4.7	16V
C19	NCB31CK-473X	CER.CAPACITOR	0.047	16V
C20	QETA1HM-107	E.CAPACITOR	100	50V
CN13	SCV2477-020	CONNECTOR	20PIN	
CN14	SSV2416-110Z	CONNECTOR	10PIN	
CN15	SSV2416-105Z	CONNECTOR	5PIN	
CN20	SSV2416-106Z	CONNECTOR	6PIN	
CN43	SSV2416-104Z	CONNECTOR	4PIN	
CN44	SSV2416-103Z	CONNECTOR	3PIN	
K1－K5	SCV2662-027	FERRITE BEADS		
T1	SCV0514-001	MIC. TRANSF.		
T2	SCV0514-001	MIC. TRANSF.		

SECTION 6
PACKING


Instructions
SC96757 (U VERSION)
SC96758 (E VERSION)
Tripod base
KA-510U
Cushion
Microphone Holder
KA-A27U
Cushion
Carton Box

■ Initial setting of switches

SW NAME	SETTING
GAIN	•
MODE	CAM
W. BAL	AUTO **1**
AUTO IRIS	NORMAL
BLACK	NORMAL
ZEBRA	ON
FILTER	3200K
DISP. MIX	OFF
MIC INPUT +48V	OFF
DNR	OFF
SHUTTER	OFF
FILE	OFF

Note: Accessories above are subject to change without notice.

SECTION 7
TECHNICAL INFORMATION

7.1 COMPARISON WITH PREVIOUS MODEL

BASIC SPECIFICATION	KY-27C	KY-D29
Pick-up Device	2/3 inch 3 IT CCD	2/3 inch 3 IT CCD
Picture Element	768H x 493V (NTSC)	768H x 493V (NTSC)
	754H x 581V (PAL)	754H x 581V (PAL)
Sensitivity	F9 at 2000 Lux	F11 at 2000 Lux
Optical Filter	3200K, 5600K, 5600K+1/16ND,	3200K, 5600K, 5600K+1/16ND,
	Cross effect	Cross effect
Minimum Illumination	1.0 Lux with Lolux	0.35 Lux with Super Lolux
S/N	62dB Typical (NTSC)	65dB (DNR ON) (NTSC)
	60dB Typical (PAL)	63dB (DNR ON) (PAL)
Horizontal Resolution	800 TV	850 TV
Detail Enhancer	Horizontal : Dual	Horizontal : Dual
	Vertical : Dual	Vertical : Dual
Color Bars	SMPTE type (NTSC)	SMPTE type (NTSC)
	EBU FULL FIELD (PAL)	EBU FULL FIELD (PAL)
White Balance	Preset / AW1 / AW2 / FAW	Preset / AW1 / AW2 / FAW
Electric Shutter (NTSC)	1/60, 1/100, 1/250, 1/500,1/1000, 1/2000	1/60, 1/100, 1/250, 1/500,1/1000, 1/2000
(PAL)	1/50, 1/120, 1/250, 1/500,1/1000, 1/2000	1/50, 1/120, 1/250, 1/500,1/1000, 1/2000
Gain Boost	0, 6, 9, 12, 18dB, ALC	-3, 0, 6, 9, 12, 18dB, ALC

FUNCTION	KY-27C	KY-D29
Full Auto Shooting	Provided	Provided
Variable scan	60.5 - 1966.7Hz, 253 Step (NTSC)	60.5 - 1966.7Hz, 253 Step (NTSC)
	50.4 - 1953.1Hz, 305 Step (PAL)	50.4 - 1953.1Hz, 305 Step (PAL)
Lolux	Lolux : +33dB Gain	Lolux : +33dB Gain
		Super Lolux : 39dB Gain
High Resolution Mode	Not provided	Normal : 380 TV line
		V.Plus : 420 TV line
		V.Max : 450 TV line
ACCU Focus	Not provided	Built-in
Smooth Trans	Not provided	Built-in
Black Stretch	Not provided	Built-in
Black Compress	Not provided	Built-in
Auto Knee	Built-in	ON/OFF switchable
Digital Noise Reduction	Not provided	Built-in
Blemish Compensate	Not provided	Built-in
DTL H / V Balance	Not provided	Variable
DTL Frequency	Not provided	LOW, MID, HIGH, AUTO

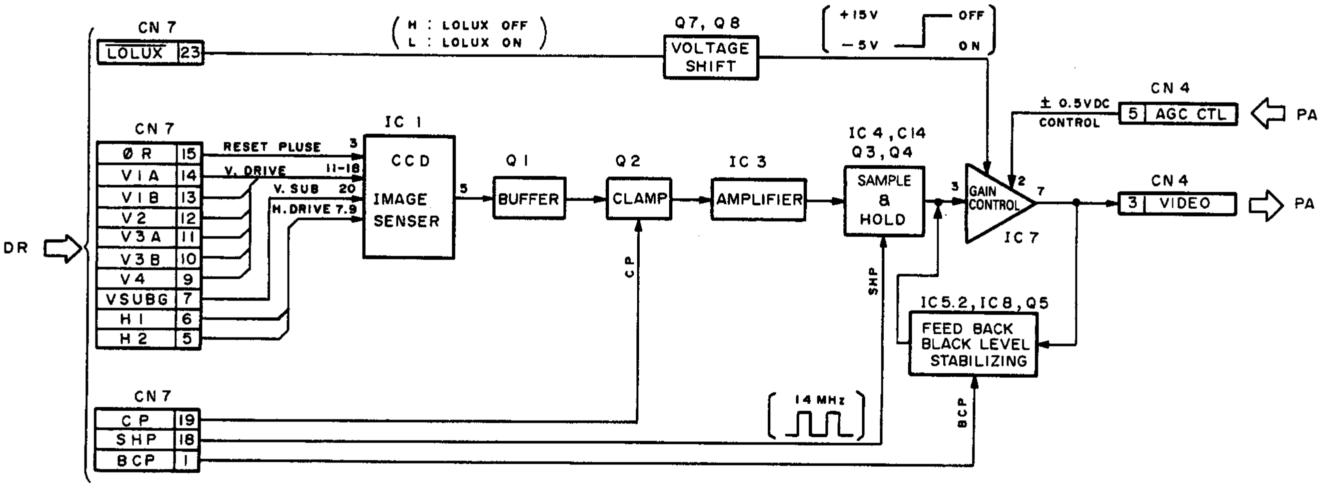
Table 7-1-1 Comparison with Previous Model

7.2 DESCRIPTION OF NEW CIRCUITRY

7.2.1 Video process circuit

The video process circuit of this camera incorporates a digital process IC for digital processing of the main process circuitry including the detail (contour), gamma and knee circuits.

The IS circuit uses a sample & hold circuit which is an improved version of the previous CDS (Correlated Double Sampling) circuit, to optimize the clamping and sampling time constants. The gain amp circuit which has been accommodated in the preamplifier board is now located in the IS board to improve the S/N.



CN 7
LOLUX 23
H : LOLUX OFF
L : LOLUX ON
Q7, Q8
VOLTAGE SHIFT
+15V
−5V
OFF
ON
CN 4
± 0.5VDC CONTROL
5 AGC CTL
PA
CN 7
ØR 15
V1A 14
V1B 13
V2 12
V3A 11
V3B 10
V4 9
VSUBG 7
H1 6
H2 5
RESET PLUSE 3
V. DRIVE 11-18
V. SUB 20
H. DRIVE 7.9
IC 1
CCD IMAGE SENSER
5
Q 1
BUFFER
Q 2
CLAMP
CP
IC 3
AMPLIFIER
IC 4, C14
Q3, Q4
SAMPLE & HOLD
SHP
3
2
7
GAIN CONTROL
IC 7
CN 4
3 VIDEO
PA
DR
IC5.2, IC8, Q5
FEED BACK BLACK LEVEL STABILIZING
BCP
CN 7
CP 19
SHP 18
BCP 1
14 MHz

Fig. 7-2-1 IS Board Block Diagram

D/A converter (IC1) on the PA board outputs DC control signals to control the other circuits. The data input to the D/A converter is the serial commands from the CPU (IC1) on the CP board.

The gain control amp of the IS board inputs the dynamic shading, in-gain, white balance and gain (-3, 0, 6, 9, 12, 18 dB, AGC) control signals and varies the gain according to their signal levels.

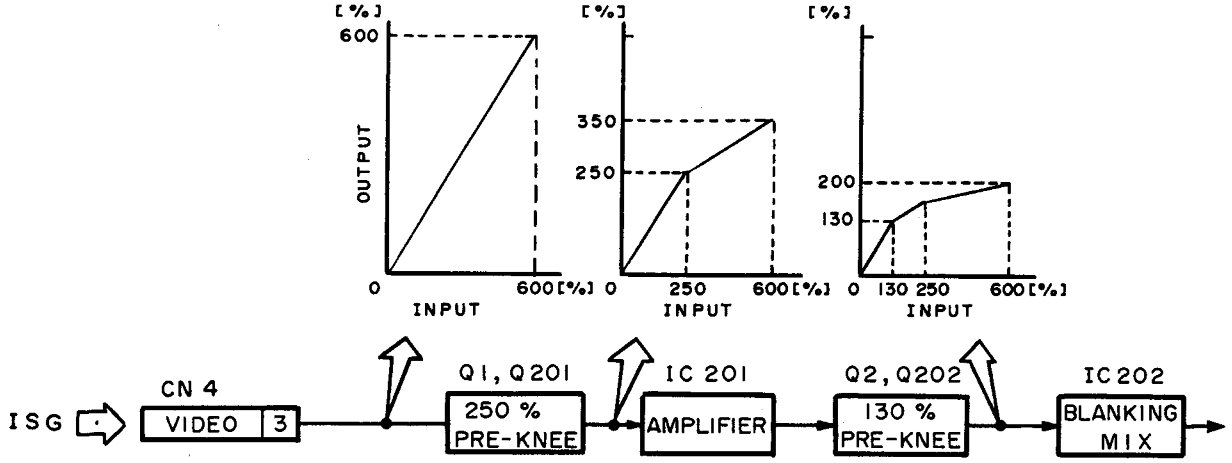
The PA board has a two-element pre-knee circuit which improves the reproducibility of the highlight sections with the following operation;

(1) First, Q201 compresses the 600% signal into the 350% signal by setting the 250% section as the knee point, and;

(2) After additional amplification, Q202 compresses the 350% signal into the 200% signal by setting the 130% section as the knee point.

This two-point pre-knee circuit enables the compression of a 600% signal into a 200% signal.

The output from the pre-knee circuit is sent through the digital process IC in the DPR1 board in the next stage and through the auto-knee circuit in the DSP so that a video with a high dynamic range which does not lose gradation even in highlight sections can be obtained.



[%]
600
OUTPUT
0
600[%]
INPUT
[%]
350
250
0
250
600[%]
INPUT
[%]
200
130
0
130
250
600[%]
INPUT
ISG
CN 4
VIDEO 3
Q1, Q201
250 % PRE-KNEE
IC 201
AMPLIFIER
Q2, Q202
130 % PRE-KNEE
IC202
BLANKING MIX

Fig. 7-2-2 Pre-Knee Circuit Block Diagram

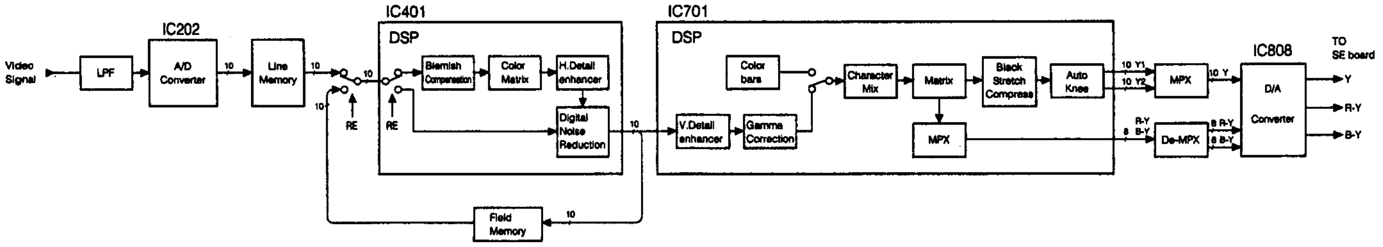
The DPR1 board incorporates the digital process circuit which uses two DSPs. These DSPs internally process the following functions.

- Contour correction (Detail enhancer)
- Color matrix
- Gamma
- Auto-knee
- Black stretch/compress
- Y/R-Y/B-Y matrix

The DSPs feature original functions made possible by the digital processing and frame memory technologies, including;

- Digital noise reduction (DNR)
- Blemish compensation

The digitally processed signal is re-converted from D to A and output as the Y/R-Y/B-Y analog component signals at the SE board.



Video Signal
LPF
IC202
A/D Converter
10
Line Memory
10
IC401
DSP
10
RE
RE
Blemish Compensation
Color Matrix
H.Detail enhancer
Digital Noise Reduction
10
Field Memory
10
IC701
DSP
Color bars
V.Detail enhancer
Gamma Correction
Character Mix
Matrix
Black Stretch Compress
Auto Knee
MPX
10 Y1
10 Y2
MPX
10 Y
R-Y
8 B-Y
De-MPX
8 R-Y
8 B-Y
IC808
D/A Converter
TO SE board
Y
R-Y
B-Y

Fig. 7-2-3 **Digital Process Circuit**

7.3 CIRCUIT DESCRIPTION OF NEW FUNCTIONALITY

7.3.1 LoLux

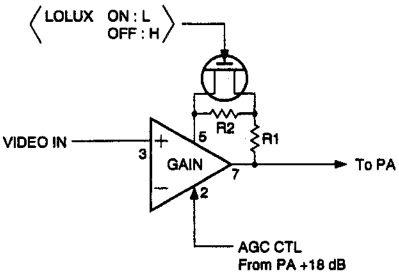
- Function

The LoLux mode boosts the gain based on electrical gain boost and the simultaneous readout of 2 pixels from each CCD.

LoLux = Electrical gain (+27 dB) + Dual-pixel readout (+6 dB) = +33dB

- Circuit operation

The D/A converter (IC1) on the PA board varies the gain of the gain control IC on the IS board through the AGC CTL terminal and boosts it by +18 dB. In addition, the FET turns ON to reduce the amplifier's feedback resistance so that the gain is boosted further by +9 dB. So, total electrical gain boost is +27dB.



LOLUX ON : L
OFF : H
R2
R1
5
VIDEO IN
3
+
GAIN
−
7
2
To PA
AGC CTL
From PA +18 dB

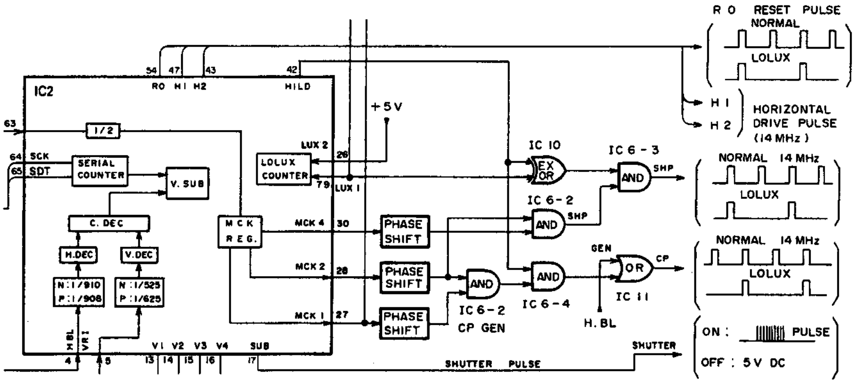
Fig. 7-3-1 LoLux-1

<Dual-pixel readout>

In the LoLux mode, the frequency of the reset pulse is halved so that the FDA amp in each CCD is reset once per 2 pixels (while it is usually reset once per pixel). As a result, the signals of the 2 pixels are added and the output level is doubled (+6 dB). As this makes it necessary that the sample & hold circuit also performs sampling of 2 pixels at a time, the CP and SHP should be divided similarly into 1/2.

NOTE

Since the adjacent pixels are added, the horizontal resolution is halved in the LoLux mode. Also note that the V.PLUS and V.MAX functions are not available in this mode.



IC2
54
47
43
42
RO
H1
H2
HILD
63
1/2
64 SCK
65 SDT
SERIAL COUNTER
V. SUB
C. DEC
H.DEC
V.DEC
N:1/910
P:1/908
N:1/525
P:1/625
HBL
VR1
4
5
V1 V2 V3 V4
13 14 15 16
SUB
17
MCK REG.
LOLUX COUNTER
LUX 2
26
79
LUX 1
+5V
MCK 4
30
MCK 2
28
MCK 1
27
PHASE SHIFT
PHASE SHIFT
PHASE SHIFT
AND
IC 6-2
CP GEN
IC 10
EX OR
IC 6-2
AND
SHP
IC 6-3
AND
SHP
AND
IC 6-4
GEN
OR
CP
IC 11
H. BL
SHUTTER PULSE
SHUTTER
R O RESET PULSE
NORMAL
LOLUX
H 1
H 2
HORIZONTAL DRIVE PULSE (14 MHz)
NORMAL 14 MHz
LOLUX
NORMAL 14 MHz
LOLUX
ON : PULSE
OFF : 5V DC

Fig. 7-3-2 LoLux-2

7.3.2 Super LoLux

- Function

This mode provides an additional gain boost to the ordinary LoLux function by doubling the CCD exposure time (slow shuttering).

S.LoLux = LoLux (+33 dB) + Slow shutter (+6 dB) = 39 dB

- Circuit description

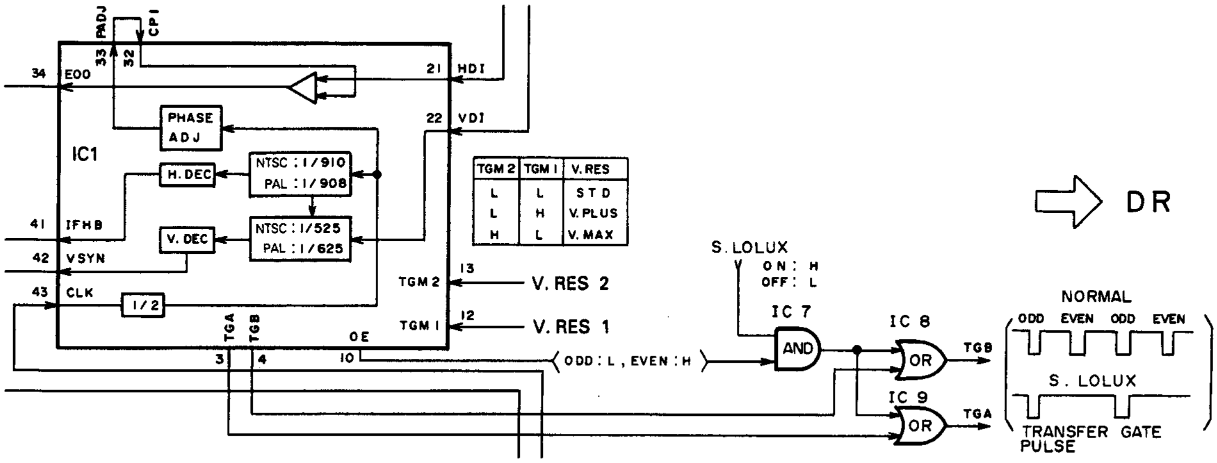

PADJ
CP1
33
32
34
EOO
21
HDI
22
VDI
PHASE ADJ
IC1
H. DEC
NTSC : 1/910
PAL : 1/908
NTSC : 1/525
PAL : 1/625
V. DEC
41
IFHB
42
VSYN
43
CLK
1/2
TGA
TGB
3
4
OE
10
TGM 2
TGM 1
13
12
V. RES 2
V. RES 1
TGM 2 | TGM 1 | V. RES
L | L | STD
L | H | V. PLUS
H | L | V. MAX
S. LOLUX
ON : H
OFF : L
IC 7
AND
ODD : L , EVEN : H
IC 8
OR
TGB
IC 9
OR
TGA
DR
NORMAL
ODD EVEN ODD EVEN
S . LOLUX
TRANSFER GATE PULSE

Fig. 7-3-3 Super LoLux-1

Pin 10 of IC1 on the TG board outputs the ODD/EVEN identification signal at every field. Pins 3 and 4 output the TG (Transfer Gate) pulse usually at every field, and this pulse opens the transfer gate so that the accumulated charged signal is moved to the vertical transfer CCD.

In the S. LoLux mode, the OR circuit IC8 & IC9 is engaged so that the TG pulse is output at every other field. This doubles the accumulation (exposure) time so the signal level is doubled from the normal level (+6 dB gain boost).

If the signal was output from the camera unchanged, a video with even fields would not be output. Therefore, as shown in Figure 7-3-4, the odd fields of the CCD output signal of each channel are stored in the field memory on the DPR1 board so that the signal of the stored odd fields is output in the periods of even fields.

NOTE

In addition to caution during the LoLux operation, also note that a residual image may be blurred with fast-moving images because the CCD exposure time is doubled (1/30s [NTSC], 1/25s [PAL]).

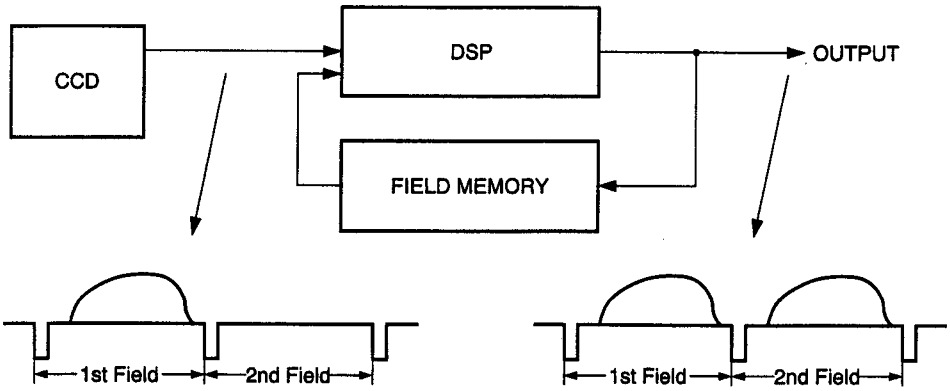

CCD
DSP
OUTPUT
FIELD MEMORY
1st Field
2nd Field
1st Field
2nd Field

Fig. 7-3-4 Super LoLux-2

7.3.3 V.RES (Vertical Resolution)

- **Function**

The V.RES modes increase the vertical resolution by changing the vertical pixel readout method. The following 3 modes are available for selection:

1. STD (Standard)	Vertical resolution 380 lines
2. V.PLUS	Vertical resolution 420 lines
3. V.MAX	Vertical resolution 450 lines

- **Vertical pixel configuration of the CCDs**

The CCDs used with this camera feature a vertical pixel count of 986 (NTSC), 1162 (PAL) pixels, which is twice that of ordinary CCDs. This high resolution is achieved by switching the readout modes.

- **Readout modes**

1. Normal mode (STD)

   The combination of 4 pixels which are vertically adjacent are changed between the odd and even fields as shown in Figure 7-3-6 and added before being output. The exposure time in this mode is 1/60 (NTSC), 1/50 (PAL) second.

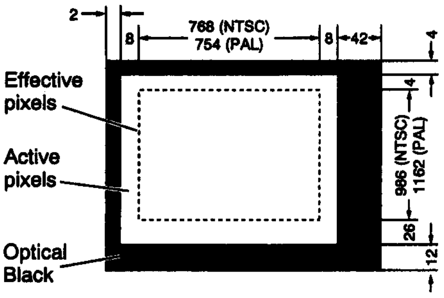
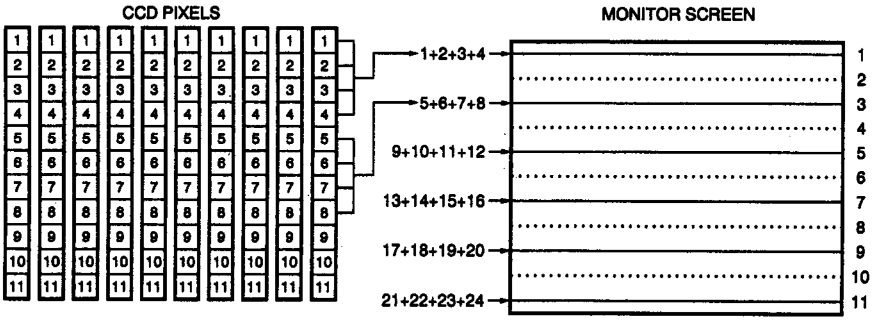

2
8
768 (NTSC)
754 (PAL)
8
42
4
Effective pixels
Active pixels
Optical Black
4
986 (NTSC)
1162 (PAL)
26
12

Fig. 7-3-5 CCD Pixel Configuration

ODD FIELD


CCD PIXELS
MONITOR SCREEN
1+2+3+4
5+6+7+8
9+10+11+12
13+14+15+16
17+18+19+20
21+22+23+24
1
2
3
4
5
6
7
8
9
10
11

EVEN FIELD

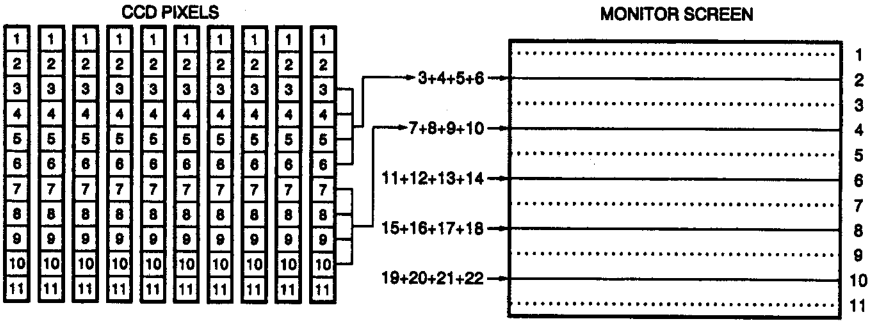
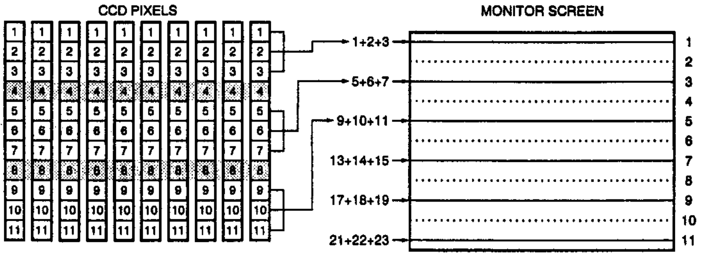

CCD PIXELS
MONITOR SCREEN
3+4+5+6
7+8+9+10
11+12+13+14
15+16+17+18
19+20+21+22
1
2
3
4
5
6
7
8
9
10
11

Fig. 7-3-6 Normal (STD) Mode

2. V.PLUS

The combination of 3 vertically adjacent pixels are changed between the odd and even fields as shown in Figure 7-3-6 and added before being output. The exposure time in this mode is 1/60 (NTSC), 1/50 (PAL) second for 2 of the 3 pixels and 1/30 (NTSC), 1/25 (PAL) second for the other pixel.

ODD FIELD


CCD PIXELS
MONITOR SCREEN
1+2+3
5+6+7
9+10+11
13+14+15
17+18+19
21+22+23

EVEN FIELD

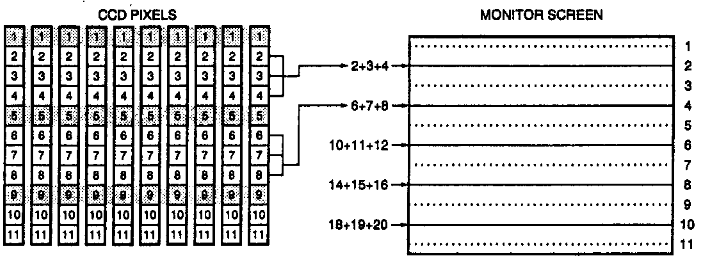
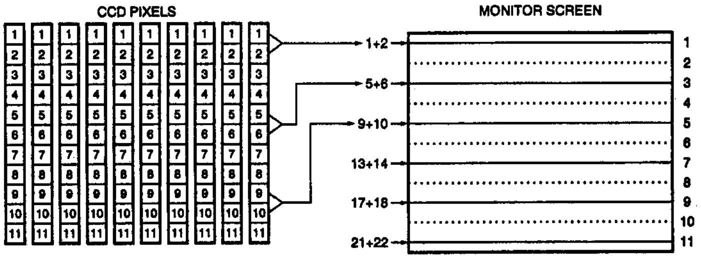

CCD PIXELS
MONITOR SCREEN
2+3+4
6+7+8
10+11+12
14+15+16
18+19+20

Fig. 7-3-7 V.PLUS Mode

3. V.MAX

The combination of 2 vertically adjacent pixels are changed between the odd and even fields as shown in Figure 7-3-8 and added before being output. Because the charged signal in passive field is thrown away, the sensitivity is decreased. The exposure time in this mode is 1/60 (NTSC), 1/50 (PAL) second.

ODD FIELD


CCD PIXELS
MONITOR SCREEN
1+2
5+6
9+10
13+14
17+18
21+22

EVEN FIELD

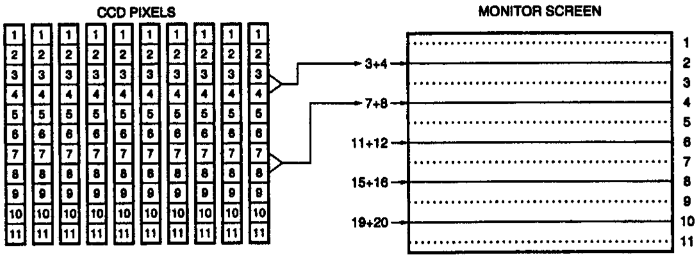

CCD PIXELS
MONITOR SCREEN
3+4
7+8
11+12
15+16
19+20

Fig. 7-3-8 V.MAX Mode

- **Circuit description**

When one of the V.RES modes is selected from the menu, the CPU outputs the serial data according to the mode as shown in Figure 7-3-9. This data is input to the D/A converter on the PA board and the two commands of V.RES1 and V.RES2 are output at JC0028 of IC1 on the TG board.

JC0028 is a timing pulse generator, which supplies the TG pulse according to the selected mode to the V. driver on the DR board to control the CCD readout mode.

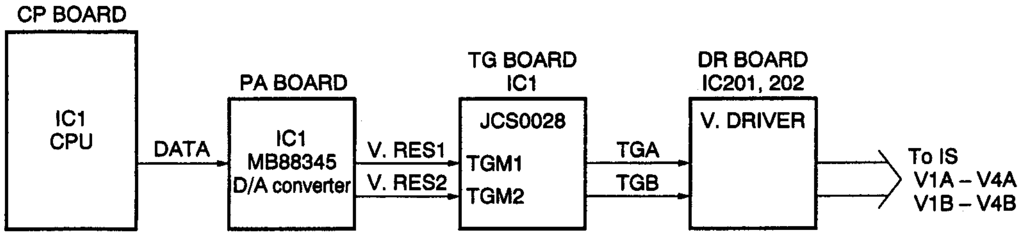

CP BOARD
IC1
CPU
DATA
PA BOARD
IC1
MB88345
D/A converter
V. RES1
V. RES2
TG BOARD
IC1
JCS0028
TGM1
TGM2
TGA
TGB
DR BOARD
IC201, 202
V. DRIVER
To IS
V1A – V4A
V1B – V4B

Fig. 7-3-9 V.RES Mode

As shown in Figure 7-3-10, photo-sensors are used in pairs and 2 pixel sets.

A and B are drived by vertical drive pulses (V1A - V4A, V1B - V4B) which generated by TGA and TGB. In the normal mode, the vertical shift register reads data of 2 pixels at a time and adds the data of 4 pixels when transferring data to the horizontal register. The relationship between the readout modes and pulses is as shown in Figure 7-3-11.

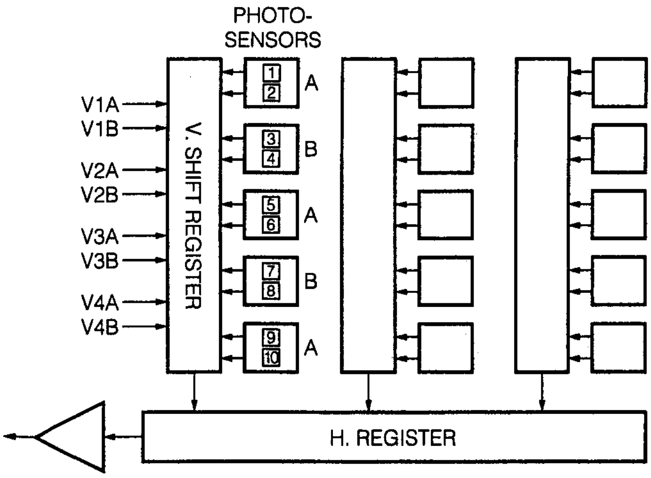


PHOTO-
SENSORS
V1A
V1B
V2A
V2B
V3A
V3B
V4A
V4B
V. SHIFT REGISTER
1
2
A
3
4
B
5
6
A
7
8
B
9
10
A
H. REGISTER

Fig. 7-3-10

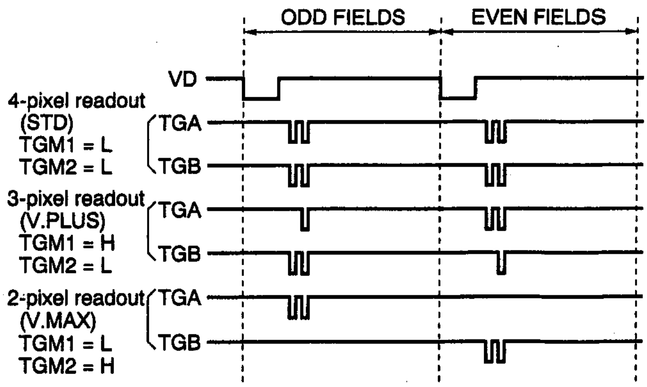

ODD FIELDS
EVEN FIELDS
VD
4-pixel readout
(STD)
TGM1 = L
TGM2 = L
TGA
TGB
3-pixel readout
(V.PLUS)
TGM1 = H
TGM2 = L
TGA
TGB
2-pixel readout
(V.MAX)
TGM1 = L
TGM2 = H
TGA
TGB

Fig. 7-3-11 Relationship Between Readout Modes and Pulses

CAUTION

The V.PLUS and V.MAX modes cannot be used when the LoLux or Super LoLux mode is selected. Also note that longer exposure time of V. PLUS mode results in noticeable residual images in moving pictures.

7.3.4 Accu-Focus

• Function

When this function is selected, it makes the depth of field shallow by automatically opening the iris for about 10 seconds to facilitate the focusing.

At the same time as above, the electronic shutter is activated automatically to correct the incident light amount which can be increased by opening the lens iris so that the 100% signal output level can always be obtained. The shutter speed can be varied up to 1/2000 second.

• Circuit description

The entire control is processed by software; as shown in Figure 7-3-12, after forcing the lens to the auto iris mode, the iris is opened by supplying DC voltage from the iris control terminal. The CPU sends the shutter data according to the level of the signal input from the NAM mix circuitry to the clock signal generator on the TG board, so that the shutter speed varies and causes the camera to output a 100% video signal.

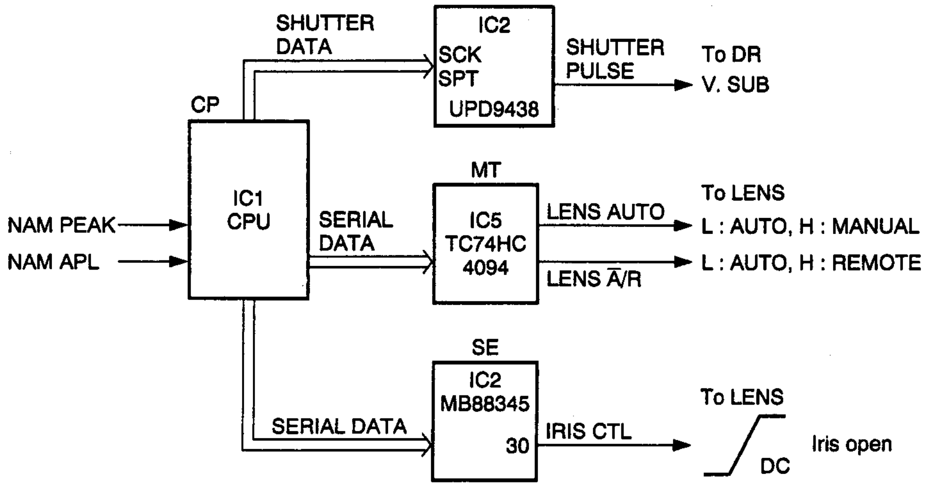

SHUTTER DATA
IC2
SCK
SPT
UPD9438
SHUTTER PULSE
To DR
V. SUB
CP
IC1
CPU
NAM PEAK
NAM APL
SERIAL DATA
MT
IC5
TC74HC
4094
LENS AUTO
LENS A/R
To LENS
L : AUTO, H : MANUAL
L : AUTO, H : REMOTE
SE
IC2
MB88345
30
SERIAL DATA
IRIS CTL
To LENS
DC
Iris open

Fig. 7-3-12 Accu-Focus

7.3.5 SMOOTH TRANS (Smooth Transition)

• Function

This function allows variation in the gain and white balance values gradually in order to avoid sudden picture changes when the gain or white balance setting is switched.

• Circuit description

The AGC control voltage input to the gain control IC on the IS board is varied gradually and smoothly by the software.

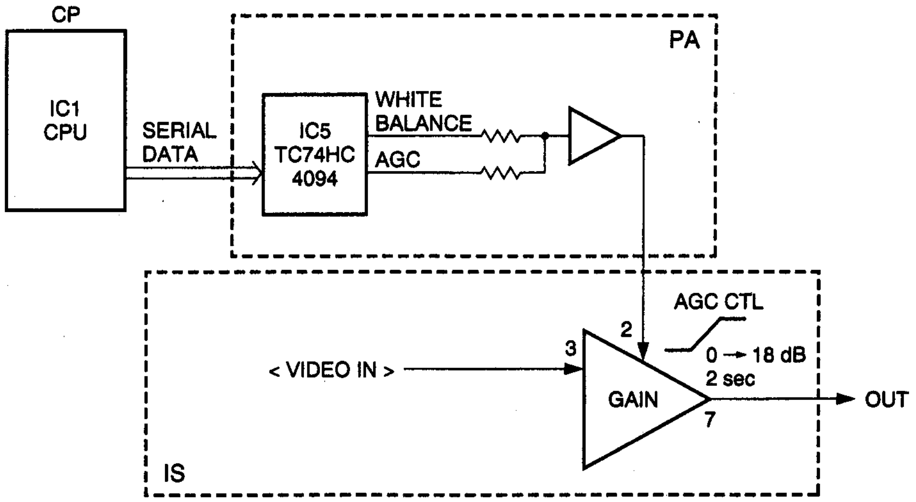

CP
IC1
CPU
SERIAL DATA
PA
IC5
TC74HC
4094
WHITE BALANCE
AGC
AGC CTL
2
3
< VIDEO IN >
0 → 18 dB
2 sec
GAIN
7
OUT
IS

Fig. 7-3-13 SMOOTH TRANS

7.4 DIGITAL PROCESSING FUNCTIONS

7.4.1 SVP (Scan-line Video Processor)

- SVP

The SVP is a video processing DSP (Digital Signal Processor) capable of high-speed image processing operations of a large number of pixels. The signal processing algorithms and operation accuracy are varied freely by the software.

- Construction of SVP

The SVP consists of the SVP core and the IG (Instruction Generator). The SVP core is composed of a 3-layer construction (data input registers - DIRs, processing elements - PEs, data output registers - DORs).

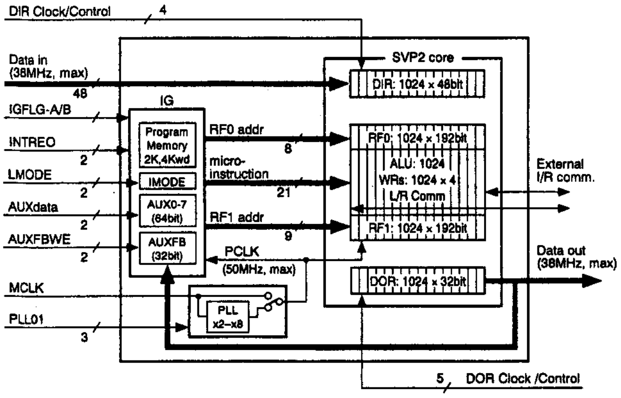

DIR Clock/Control
4
Data in
(38MHz, max)
48
IGFLG-A/B
INTREO
2
LMODE
2
AUXdata
2
AUXFBWE
2
MCLK
PLL01
3
IG
Program Memory 2K,4Kwd
IMODE
AUX0-7 (64bit)
AUXFB (32bit)
RF0 addr
8
micro-instruction
21
RF1 addr
9
PCLK
(50MHz, max)
PLL x2–x8
SVP2 core
DIR: 1024 x 48bit
RF0: 1024 x 192bit
ALU: 1024
WRs: 1024 x 4
L/R Comm
RF1: 1024 x 192bit
DOR: 1024 x 32bit
External I/R comm.
Data out
(38MHz, max)
5
DOR Clock /Control

Fig. 7-4-1 Construction of SVP

To process video signals in real time, the series of operations from the data input through DIRs to the processing using PEs and the data output through DORs are performed in a pipeline method using independent clock signals.
A large number of PEs are arranged in parallel so that their parallel operation increases the signal processing speed. The PEs are arranged in parallel according to the SIMD (Single Instruction stream - Multiple Data stream) configuration and 1024 PEs (ROM version : 864PEs) are used to process the image data of a single scanning line simultaneously.
The SIMD configuration has the program determining the operations of the PEs (IG) on only one chip and all PEs perform the same operations according to this program. The presence of a single IG makes it possible to integrate many PEs with relatively simple structures and assign a PE to every pixel.

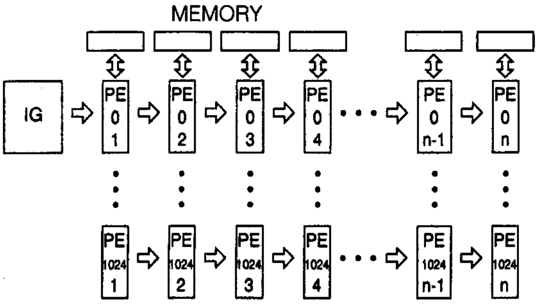

MEMORY
IG
PE 0 1
PE 0 2
PE 0 3
PE 0 4
PE 0 n-1
PE 0 n
PE 1024 1
PE 1024 2
PE 1024 3
PE 1024 4
PE 1024 n-1
PE 1024 n

Fig. 7-4-2 SIMD Type Parallel Processing

Each PE is composed of a 1-bit ALU, four working registers (WRM, WRA, WRB, WRC) and two 192-bit register files (RF0, RF1). Each PE is connected to a 48-bit DIR and 32-bit DOR.

- Operation of SVP
  - Pipeline operation of each line using DIRs, PEs and DORs

1. The video signal is input into the DIRs at the positive-going edge of each SWCK (DIR clock). After the scanning line data of a line has been accumulated in the DIRs, the DIR data is transmitted to RF1 in the PEs in the next horizontal blanking period.
2. The image processing operations are performed by the PEs in a single horizontal scanning period.
3. In the next horizontal blanking period, the results of PE operations by RF0 are transmitted to the DORs, and the DOR data is output at the positive-going edge of the SRCKs (DOR clock signals).

- The output data is delayed by at least 2 lines and additional line delay also occurs during the vertical signal processing.

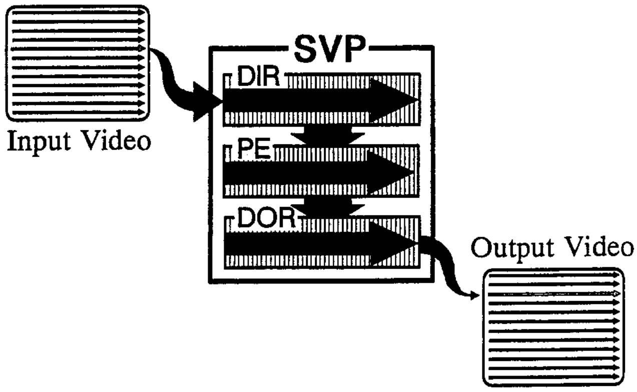

Input Video
SVP
DIR
PE
DOR
Output Video

Fig. 7-4-3 SVP Operation

7.4.2 DNR (Digital Noise Reduction)

- Function

This function reduces noise produced during shooting of the video signal.
It can be activated at any gain from 0 dB to +18 dB as well as in the LoLux and Super LoLux modes.

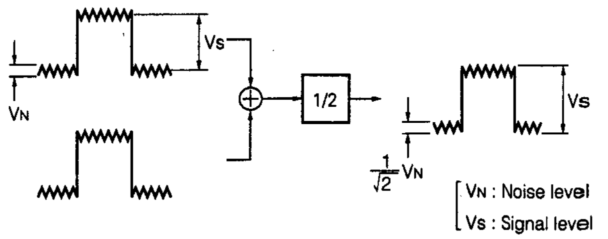

Vs
VN
1/2
Vs
$\frac{1}{\sqrt{2}}$VN
VN : Noise level
Vs : Signal level

Fig. 7-4-4 Principle of DNR

Video signal generally has strong correlation between two pixels neigboring each other in the vertical, horizontal or field direction but has not correlation among random noises.
If two signals having strong correlation with each other are summed up, the total signal level becomes double but noise level is not double but $\sqrt{2}$ since noise is generated at random. Therefore, if the summed up signal is halved to return to the original level, noise level decreases to $1/\sqrt{2}$. In general, signals having strong correlation are added N times, there is no change in the mean level but noise level is reduced to $1/\sqrt{N}$.
This principle applies to the noise reducer.

Principle of DNR

- Operation description

With this model, noise reduction is performed during operation by using the above principle.

(1) The DSP output signals Ⓐ are stored in the field memory.

(2) By subtracting the stored signal of the previous field Ⓐ from the video signal of a field Ⓑ, the noise component Ⓒ can be obtained because it is random and not compensated for by the subtraction.

(3) Then, by subtracting the noise component Ⓒ from the current field signal Ⓑ, the DNR can output a video signal with less noise Ⓓ.

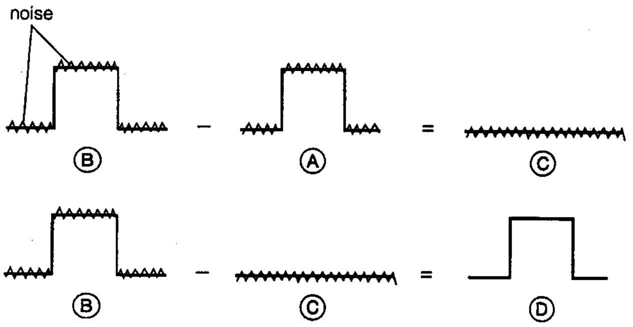


Fig. 7-4-5 Noise Reduction Method

The following operation is carried out in the circuit.

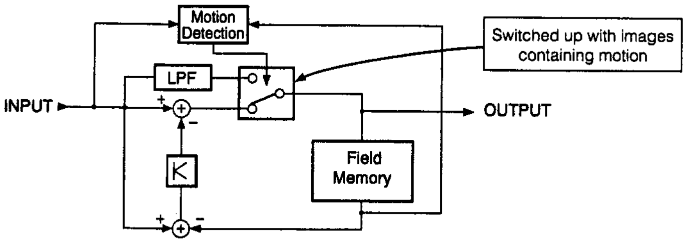


Fig. 7-4-6 DNR Block Diagram

Fig. 7-4-6 shows a block diagram of DNR. The improving rate of this circuit in the S/N ratio is given by the following equation.

$$\text{S/N ratio improvement} = 10 \log \frac{1+K}{1-K} \quad \left(K : \text{Recursive coefficient}\right)$$

In other words, the larger the recursive coefficient is (as nearly as 1), the more the S/N ratio is improved, however, increase in the S/N ratio improvement yields much more residual images. For, differential component (field differential component) between the current field and the previous field contains not only noise but also motion signal component, and subtraction of a field differential signal from the original signal results in removal of motion signal component.

Therefore, the DSP performs motion detection so that images containing much motion are not subjected to the DNR processing but that their noise is reduced by filtering using the LPF.

< DNR control >

When the [DNR] switch on the camera is switched, the levels of the 2 control signals input to pins 16 and 18 of IC9 on the CP board are switched between H and L as shown in Table 7-4-1. Based on the combination of the 2 control signals, IC9 sets the DNR ON/AUTO/OFF and transmits this data to the CPU (IC1) in the form of 8-bit parallel data.

The CPU transfers the data to the PTC (IC603) on the DPR1 board. The PTC is used to control the DNR function in DSP (IC401).

DNR	IC9	
	Pin 18	Pin16
ON	H	L
AUTO	L	H
OFF	H	H

Table 7-4-1 Relationship Between DNR Switch Settings and IC9 Input Levels

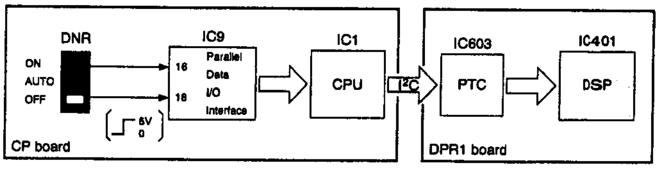


Fig. 7-4-7 DNR Operation

■ Operation when the [DNR] switch is set to "ON"

While the [DNR] switch is set to "ON", the effective level of the DNR can be set to LOW, MIDDLE or HIGH at the "DNR LEVEL" of the [ADVANCED MENU]. By changing this switch, the recursive coefficient K is altered in the DNR circuit. For example, when "HIGH" is set, the value of K becomes larger and the more the S/N ratio is improved, however, increase in the S/N ratio improvement yields more residual images.

■ Operation when the [DNR] switch is set to "AUTO"

When the [DNR] switch is set to "AUTO", the DNR levels are automatically switched according to the GAIN setting as shown in the table 7-4-2.

GAIN	DNR LEVEL
-3dB , 0dB	OFF
6dB , 9dB	LOW
12dB , 18dB	MIDDLE
LOLUX , S.LOLUX	HIGH

Table 7-4-2 DNR Levels According to the GAIN Setting (in AUTO mode)

7.4.3 Blemish Compensation

- Function

This function compensates for the blemishes (flaws with high signal levels) produced by CCDs by a digital technique using memory. As this function is required only after replacing the optical block assembly or when a new blemish is produced, and not necessary in normal use. The detection of the blemishes to be compensated for can be performed with a service menu (see section 2.9).

- Detection

Blemishes are detected by DSP (IC401) on the DPR1 board. the DNR (see previous section) is applied to reduce the video signal noise and allow accurate detection.

The output signal from a point where a blemish occurs is characterized by a partial increase in the level. The DSP sets a certain detection level and compensates for the blemishes which exceed this level.

The number of blemishes which can be compensated for is up to 13 as total of three channels. When more than 14 blemish points are detected, the detection level is increased so that only the 13 blemishes with the higher levels can be compensated for.

The compensation points are set every time the detection (ERROR DETECT START) is activated.

The detected position data is stored in the EEPROM (IC7) on the CP board.

When power is turned ON, the CPU sends the detection position address data to DSP (IC401).

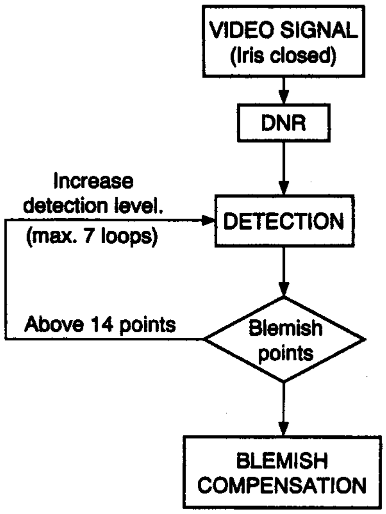

VIDEO SIGNAL (Iris closed)
DNR
Increase detection level. (max. 7 loops)
DETECTION
Above 14 points
Blemish points
BLEMISH COMPENSATION

Fig. 7-4-8 Blemish Detection Flow Chart

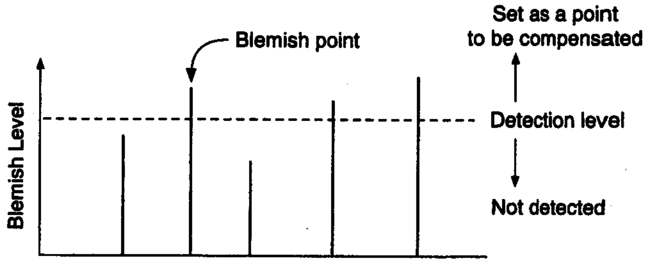

Blemish point
Set as a point to be compensated
Detection level
Not detected
Blemish Level

Fig. 7-4-9 Blemish Detection

> **NOTE**
> **The iris is forced to close during the detection. If the iris is not closed for somereason, "IRIS NOT CLOSED?" is displayed on the viewfinder and monitor screen and a detection error occurs.**
> **The detection is possible by capping the lens mount.**

- Compensation

At the moment the power is turned ON, the blemish position address data stored in the EEPROM (IC7 on the CP board) is transmitted in serial communication to the DPR1 board and stored in the field memory (IC402 - IC405).

The DSP compensates for blemish by using the blemish position data stored in the field memory as it occurs in real time.

As shown in Figure 7-4-10, compensation is performed by assigning the average level of the signals on both sides of the blemish point as compensation signals.

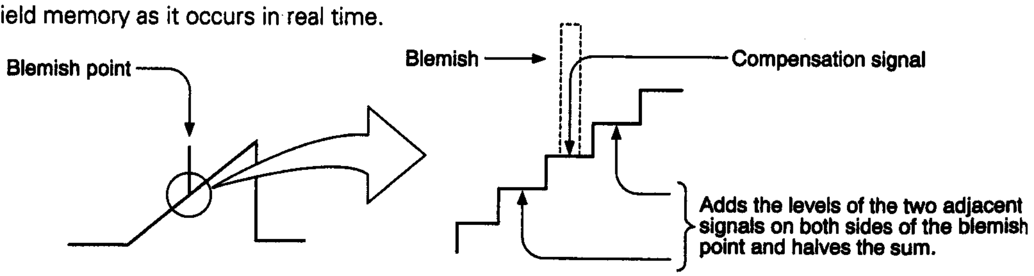

Blemish point
Blemish
Compensation signal
Adds the levels of the two adjacent signals on both sides of the blemish point and halves the sum.

Fig. 7-4-10 Blemish Compensation

7.4.4 Black stretch

• Function

This function stretches the signals of low-illuminance level sections so that the contrast of the dark sections can be seen.

• Operation

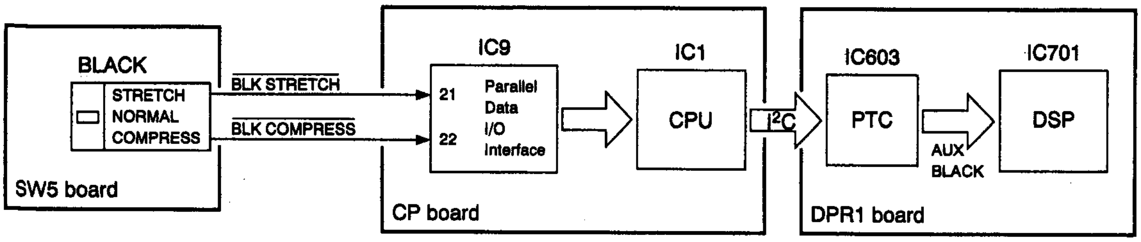


Fig. 7-4-11 Black Stretch/Compression

Description IC9 (Parallel Data I/O Interface) on the CP board inputs the control signals from the external switches and transmits the switch setup to the IC1 (CPU) in the form of 8-bit parallel data to control the operation of the camera.

When the [BLACK] switch of the camera is set to STRETCH, pin 21 of IC9 on the CP board goes L level. The 8-bit parallel data output from IC9 is used to transmit the black stretch ON data to IC1.

The CPU transfers the data to the PTC (IC603) on the DPR1 board, and the PTC switches the camera for the black stretch control by means of the BLACK STRETCH / COMPRESS control signal.

The DSP (IC701) controls how the gamma correction is applied, by increasing the gamma correction level of low-illuminance sections to a higher level than usual.

7.4.5 Black compression

• Function

This function provides the picked-up image with additional contrast in case the image is generally bright and contains little contrast.

• Operation description

When the [BLACK] switch is set to COMPRESS, pin 22 of IC9 on the CP board goes L level and the DSP switches the camera for the black compression control (see Figure 7-4-10).

The DSP corrects gamma of the low-illumimance sections by decreasing their level on the contrary to the black stretch operation.

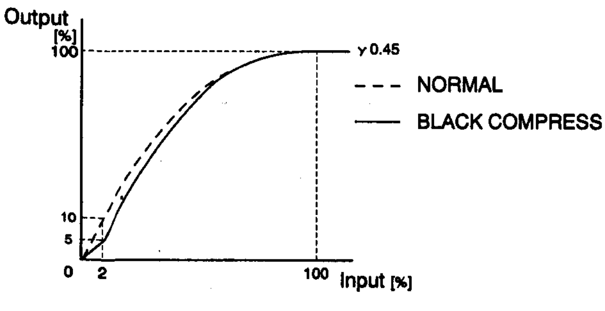


Fig. 7-4-13 Black Compression

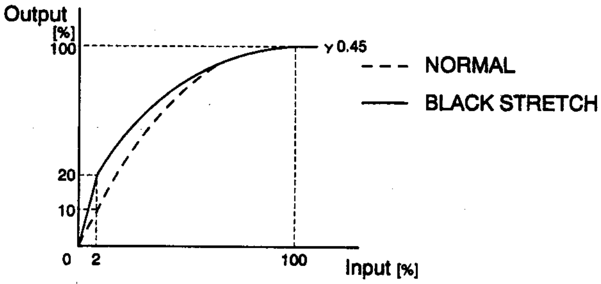


Fig. 7-4-12 Black Stretch

7.4.6 Knee (Auto-knee) circuit

• Function

This camera achieves a dynamic range of 600% by first applying the pre-knee processing using the 250% and 130% sections as the knee points in the analog circuitry (see section 7.2.1) then applying the knee processing using the 100% (80 to 100% in auto-knee operation) section as the knee point in the digital circuitry.

• Operation description

After being compressed to 200% by the pre-knee circuit described above, the signal is subjected to the knee processing using the 100% section as the knee point by the DSP on the DPR1 board. As a result, the signals of 100% to 200% sections are compressed to 10% and the maximum output level of the DSP becomes 110% as show in Fig.7-4-14.

In the 600% input signals, the sections from 100% to 600% are compressed to 10% with the above process.

- Auto-knee

This is a function which reproduces the level of the high-illuminance section above 100%. [MENU] item "AUTOKNEE" is provided to allow varying the knee point set in the DSP between 70% and 100% automatically according to the video level. This function is the auto-knee function.

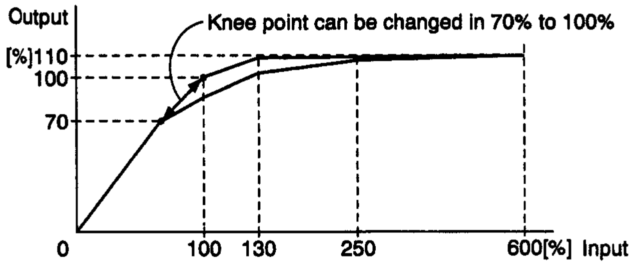


Fig. 7-4-14 Knee (Auto-Knee) Circuit

7.4.7 Detail enhancer

- Function

The detail enhancer is a function similar to the conventional contour compensation which enhances the contour of objects. This function is carried out digitally in the DSP.

This camera applies a two-way correction to both the horizontal and the vertical signals. The detail signals (contour enhancing signals) are generated by obtaining edge components after calculating video signals in the DSP.

The noise slicing of the detail signals is also performed in the DSP. The slice level corresponds to the GAIN, so the higher the GAIN becomes, the higher the threshold level of the slice becomes.

The channels to be mixed with horizontal and vertical detail signals are shown in the Table 7-4-3.

Detail signals	Source signals	Mix channels
H detail signals	G CH signal	G CH
	R CH signal	B & R CHs
V detail signal	R + G CHs signal	B & G & R Chs

Table 7-4-3 Channels to be mixed with source signals

- Operation description

The detail signals are calculated by the coefficients of the signal levels at 3 points including those before and after the sampling point of the image signal.

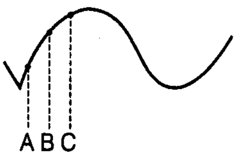


Fig. 7-4-15

When it is assumed that three sampling points, A, B and C exist, the detail signal of point B is calculated from the signals of point A and C which are located before and after the point B.

Detail signal of point B = -0.25A + 0.5B - 0.25C

For example, calculation of the image signal shown in the Figure 7-4-17

(1) B: the point where there is no change in the video signal level (A=B=C)

-0.25A + 0.5B - 0.25C = 0

(2) C: the contour section of the image (B=C=0, D=1)

-0.25B + 0.5C - 0.25D = -0.25

Then, the detail signals towards the negative direction are generated.

(3) D: the contour section of the image (C=0, D=E=1)

-0.25B + 0.5C - 0.25D = +0.25

Then, the detail signals towards the positive direction are generated.

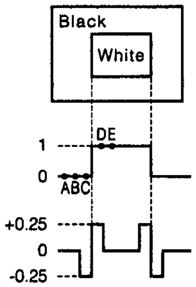


Fig. 7-4-16 Detail Enhancer

The generation of the detail signals is the same for both the horizontal and the vertical.

With the horizontal detail signal, the frequency of the contour enhancement can be set with the setting of the "DTL. FREQUENCY" of the [ADVANCED MENU].

When Auto mode, the detail frequency can be changed automatically either Low, Middle, High or Super High (7 MHz), depend on the position of zoom.

When the zoom position is tele side, the frequency set to low, when it is wide, the frequency become high.

DTL. FREQUENCY	Contour enhancement Frequency
HIGH	Approx. 5 [MHz]
MIDDLE	Approx. 4 [MHz]
LOW	Approx. 2.5 [MHz]

Table 7-4-4 Horizontal Detail Signal Frequency

By changing the setting of the "DTL. H/V BAL", whether or not the enhancement for the horizontal or vertical direction should be stronger, can be set.

The levels of the horizontal and of the vertical detail signals can be varied by changing the value of "DETAIL" on the [MENU].

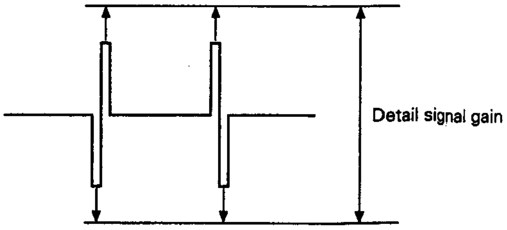
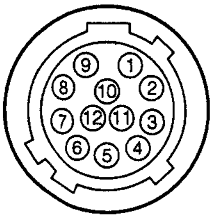


Fig. 7-4-17 GAIN Variation of Detail Signals

7.5 SPECIFICATION OF INTERFACE

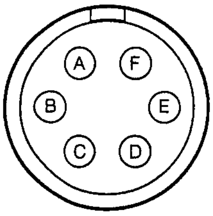
7.5.1 Lens connector



(EXT VIEW)

Pin No.	Signal	Specification	FROM	TO
1	LENS RET	Hi-Z or LOW (GND)	LENS	CAMERA
2	LENT VTR TRIGGER	Hi-Z or LOW (GND)	LENS	CAMERA
3	GND	GND		
4	LENS AUTO/MANUAL	MANUAL : 0V, AUTO : 5V	CAMERA	LENS
5	IRIS CTL	OPEN 7.3V, CLOSE : 2.5V	CAMERA	LENS
6	UNSWITCHED 12V	12V DC	CAMERA	LENS
7	IRIS POSITION	OPEN : 7.3V, CLOSE : 2.5V	LENS	CAMERA
8	IRIS AUTO/REMOTE	REMOTE : 0V, AUTO : 5V	CAMERA	LENS
9	EXTENSION ON/OFF	LENS EXTENSION ON : Hi-Z, OFF : 0V	LENS	CAMERA
10	ZOOM POSITION	WIDE : 2V, TELE : 7V	LENS	CAMERA
11	NOT USED			
12	NOT USED			

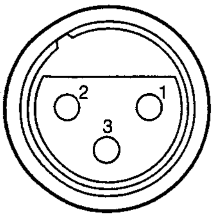
7.5.2 View finder connector



(EXT VIEW)

Pin No.	Signal	Specification	FROM	TO
A	TALLY ON/OFF	ON : 5V, OFF : 0V	CAMERA	VF
B	SWITCHED 12V	DC 10.5V – 17V	CAMERA	VF
C	GND		CAMERA	VF
D	GND		CAMERA	VF
E	VIDEO IN	1Vp-p, 1K ≦ Zi ≦ 10K OHM	CAMERA	VF
F	BATTERY ALARM	TTL	CAMERA	VF

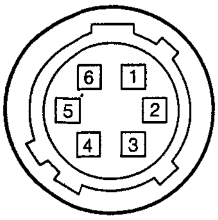
7.5.3 Mic connector



(EXT VIEW)

Pin No.	Signal	Specification	FROM	TO
1	MIC IN GND		MIC	CAMERA
2	MIC IN HOT	-60dBm Balanced (+48V PHANTOM)	MIC	CAMERA
3	MIC IN COLD	(+48V PHANTOM)	MIC	CAMERA

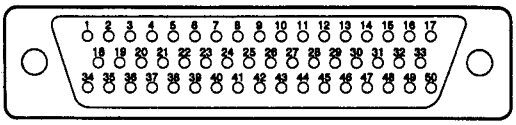
7.5.4 RM connector



(EXT VIEW)

Pin No.	Signal	Specification	FROM	TO
1	GND		CAMERA	RM
2	OPERATE (Remote/Local)	REMOTE : 5V, LOCAL : 0V	RM	CAMERA
3	GND		CAMERA	RM
4	SID4	SERIAL DATA (TXD)	CAMERA	RM
5	SID3	SERIAL DATA (RXD)	RM	CAMERA
6	9V	DC INPUT	CAMERA	RM

7.5.5 50 Pin connector



(EXT VIEW)

Pin No.	Signal	Specification	FROM	TO
1	5V OUT	5V DC OUT	CAMERA	KA-27
2	GND	GND		
3	9V	9V DC OUT	CAMERA	ADAPTERS
4	–5V	–5V DC OUT	CAMERA	ADAPTERS
5	GND			
6	GND			
7	ANTON BAUER	0V TO 5V DC INPUT	BATTERY	CAMERA
8	V.SYNC OUT	5Vp-p (downward)	CAMERA	ADAPTERS
9	REAR TALLY	ON : 0V, OFF : 5V	CAMERA	RM-P270
10	GENLOCK IN	VBS OR BLACK BURST, Zi=75 OHM	KA-27	CAMERA
11	NOT USED			
12	Y2 OUT	1Vp-p[SYNC : 0.286(N)/0.3(P) Vp-p], Zo=75 OHM		
13	DIGITAL S VTR DETECT	DIGITAL-S VTR L LOW, other : Hi-Z	VTR	CAMERA
14	COLOR FRAME PULSE			
15	MIC GND	AUDIO L CH GND	CAMERA	VTR/ADAPTERS
16	MIC COLD	AUDIO L CH COLD	CAMERA	VTR/ADAPTERS
17	MIC HOT	AUDIO L CH HOT –20dBm BALANCED	CAMERA	VTR/ADAPTERS
18	RETURN VIDEO IN	1Vp-p, Zi=2.2K OHM	VTR/ADAPTERS	CAMERA
19	SYNC OUT	5Vp-p, CMOS OUTPUT	CAMERA	ADAPTERS
20	C (CHROMA) OUT	0.286(N)/0.3(P)Vp-p, Zi=1K OHM	CAMERA	S-VHS VTR
21	GND			
22	GND			
23	GND			
24	GND			
25	SAVE CONTROL	ST-BY : 5V, SAVE : 0V	CAMERA	VTR
26	LENS RETURN SWITCH	RETURN : LOW, NORMAL : Hi-Z	CAMERA	VTR/ADAPTERS
27	VTR START/STOP	START : 5V, STOP : 0V DC	CAMERA	VTR/ADAPTERS
28	RM CONTROL IN	RM : LOW, NORMAL : Hi-Z	ADAPTERS	CAMERA
29	R-Y OUT	0.7V(N)/0.525V(P), Zo=1K OHM	CAMERA	VTR/ADAPTERS
30	R OUT	1.4Vp-p, Zo=2K OHM	CAMERA	ADAPTERS
31	ST-BY/SAVE OUT	ST-BY : 9V, SAVE : 5V DC	CAMERA	VTR/ADAPTERS
32	RETURN AUDIO IN	–6dBs, Zi=20K OHM UNBALANCED	VTR/ADAPTERS	CAMERA
33	GND			
34	G OUT	1.4Vp-p, Zo=2K OHM	CAMERA	ADAPTERS
35	GND			
36	B-Y OUT	0.7V(N)/0.525V(P), Zo=1K OHM	CAMERA	VTR/ADAPTERS
37	B OUT	1.4Vp-p, Zo=2K OHM	CAMERA	ADAPTERS
38	PLAYBACK CONTROL	EE : 5V or Hi-Z, PB : LOW	VTR	CAMERA
39	12V DC IN	10.5V TO 17V DC INPUT	VTR/ADAPTERS	CAMERA
40	12V DC IN	10.5V TO 17V DC INPUT	VTR/ADAPTERS	CAMERA
41	Y1/Y2 OUT	1Vp-p[SYNC : 0.286(N)/0.3(P) Vp-p], Zo=1K OHM	CAMERA	VTR/ADAPTERS
42	GND			
43	COMPOSITE VIDEO OUT	1Vp-p, Zo=75 OHM	CAMERA	VTR/ADAPTERS
44	GND			
45	DIGITAL CAMERA DETECT	DIGITAL CAMERA : LOW, OTHERS : Hi-Z	CAMERA	VTR
46	S-VHS CONTROL IN	Y/C OUT : LOW, COMPONENT OUT : HIGH	VTR	CAMERA
47	SID TXD	SERIAL COMMAND, TTL	CAMERA	VTR
48	SID RXD	SERIAL COMMAND, TTL	CAMERA	VTR
49	NOT USED			
50	CALL	CALL IN : LOW		